

AMATEUR RADIO

DECEMBER 1989



THE WIA RADIO AMATEUR'S JOURNAL

KENWOOD

KNOCKOUT DUAL-BAND DUO!

TM-731A

The Kenwood TM-731A redefines the original Kenwood term "dual bander". The wide range of innovative features include a dual watch function, selectable full duplex operation, automatic band change, 30 memory channels, large dual LCD displays, programmable scanning, and 50 watts of output on 144 MHz and 35 watts on 430 MHz.

The optional RC-10 multi-function handset remote controller is also available, making the TM-731A even more enjoyable to operate.

Features:

- Ultra Compact design with easy to install mount.
- Multi function microphone with programmable function key.
- High sensitivity receiver and an improved antenna switching circuit for wide dynamic range.
- Hi/Lo power switch for power reduction to 5 watts when high power not needed.
- Dual watch function to receive both 144 MHz and 430 MHz bands at the same time.
- 30 Memory channels with Lithium battery backup.
- Various scan modes are provided including band scan, programmable band scan, memory and dual scans.
- Frequency lock function prevents accidental loss of selected frequency.
- Dual frequency selector may operate independently of each other for main and sub-bands.
- Sliding balance controls audio output between main and sub-bands.
- Easily selectable dual and single band operations.
- Large amber multi-function LCD display for best visibility in sunlight or after dark.
- Built-in selectable CTCSS Tone Encoder

TH-75A

The TH-75A combines the 2m and 70cm bands together into one compact, feature-filled hand-held package. Large dual LCD displays, dual watch, selectable full duplex operation, tone alert and many additional features make this dual band HT different from the rest.

Features:

- Dual watch function allows you to receive both VHF and UHF bands at the same time.
- Built in 2 VFOs for main and sub-bands.
- Large multi-function LCD display provides excellent visibility.
- Tone Alert System for both bands causing a beeper tone to signal the presence of an incoming signal.
- Automatic band change function changes between main and sub-bands when a signal is present.
- Selectable dual and single band operations.
- Five watts RF output is available when operated with 13.8 VDC.
- Balance control for main and sub-band audio output.
- 10 Multi-function memory channels plus call channel for each band, with lithium battery backup.
- Various scan modes are provided including band scan, programmable scan, memory and dual scan.
- Auto battery saving circuit increases battery life.
- Auto-power off function.



KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(INCORPORATED IN N.S.W.)

4E Woodcock Place, Lane Cove, N.S.W. 2066, Australia
Ph. (02) 428 4222, (02) 428 1455, Fax (02) 427 6869
Call now for further information and the name of your nearest authorised Kenwood dealer.

Please phone, mail or fax for information

Name

Address

Postcode

Publication Issue

Model



Amateur Radio is published by the Wireless Institute of Australia, as its Official Journal on the last Friday of the previous month.

EXECUTIVE EDITOR

Bill Rice VK3ABP

MANAGING EDITOR

Graham Thornton VK3IY

NEWS EDITOR

Jim Linton VK3PC

SENIOR TECHNICAL EDITOR

Peter Gibson VK3AZL

TECHNICAL EDITORS

David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
Peter O'Connor VK4KIP
Gil Sones VK3AUI
Phil Steen VK4APA
Roy Watkins VK6XV

DRAFTING

Vicki Griffin VK3BNK

ADVERTISING

Ann McCurdy

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -

The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office

3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191

Fax: (03) 523 8191
(Non dedicated line)

Deadlines

	Editorial	Hamads
January	4/12/89	6/12/89
February	8/1/90	10/1/90
March	5/2/90	7/2/90

© Wireless Institute of Australia 1989

CONTENTS

Technical

A VLF-LF Receiver	10
<i>Lloyd Butler VK5BR</i>	
Morse Code is a Myth	16
<i>Mervyn Eunson VK4SO</i>	
TR-7 Operation with VHF Transverters	28
<i>RL Drake Co.</i>	
Valve Receiver Conversions	21
<i>Rob Gurr VK5RG</i>	

General

Antenna Impedance Matching (Book Review)	57
<i>Ron Cook VK3AFW</i>	
Better TV & Radio Reception (Book Review)	30
<i>Jim Linton VK3PC</i>	
JAL Ham Fair	35
<i>David Wardlaw VK3ADW</i>	
WIA 80 Competition	34

Operating

Awards	
ANZAC, VR6 Bicentennial	43
Connecticut DXA	44
Contests	
Calendar, French Contest Rules (1990)	41
Australasian Sprint Results	41

Columns

Advertisers Index	64	How's DX	36
ALARA	50	Intruder Watch	56
AMSAT	46	Morseword no.33	40
Club Corner	53	Over to you - Members Opinions	58
Data and Digital	48	Pounding Brass	45
Divisional Notes		QSLs from the WIA Collection	51
VK2	54	Silent Keys - Obituaries	58
VK3, VK4	55	Spotlight on SWLing	49
5/8 Wave, VK6	56	VHF/UHF - An Expanding World	38
Education Notes	54	WIA Directory	23
Hamads	62	WIA News	3
		WICEN	46



Cover

Peter Gamble VK3YRP, Federal President of the WIA. See page 2 for an important message.

Why be a Member of the WIA ?

This is a question that crosses an Australian radio amateur's mind from time to time and deserves a reasoned response.

On first consideration the answers can be grouped under three headings:

- the tangible,
- the intangible, and
- the fair go.

Tangible Benefits

A couple of years ago the WIA was frequently confronted with the assertion "All I get for my membership is a magazine!" This led to a review of what services were provided, who were the providers of the services and did non-members receive some, or all, of these benefits for free?

The last count on this score showed some forty services, spread almost equally between the Executive Office and the Divisions. Never-the-less, it is a fact that, to most members, Amateur Radio magazine is the most tangible evidence of membership. That is why AR

PRESIDENT'S MESSAGE

PETER GAMBLE VK3YRP FEDERAL PRESIDENT

conducted a survey of its readers last year.

After the magazine, I would suggest that repeaters, news broadcasts and QSL bureaux rank next in importance. Each of these services is visible, useful and, as it happens, free to non-members, except perhaps QSLs which cost only a nominal fee.

It is also a fact that members services are highly dependent upon proximity to the servers, which are the Divisions in capital cities and large radio clubs across the country. In an ideal situation the country member should feel he is as well served as his city counterpart and I believe this is achievable as clubs become more involved in the server role.

A number of members services are valued highly, but only infrequently invoked. These include advice on planning approval for towers, EMC support (when interference becomes a problem) and information on reciprocal and visitors licences for overseas trips. The first two can be very emotive

issues when they are invoked!

It is frequently said that for communicators, we are very poor at communicating! I believe this is very true and it is not assisted by our three tier management structure of Federal, Divisions and members.

As President, I am putting a lot of effort into helping break down those communications barriers. I see the need to use all means at our disposal, including AR magazine, Federal tapes on our news and information broadcasts and word of mouth.

It is also a characteristic of our hobby that we tend frequently to communicate erroneous matter, rumours and disinformation. Our sister society in the USA, the ARRL, observed this in a recent QST editorial where they examined the great potential power of packet radio both to aid and damage amateur radio depending on the thought applied to its use. Indeed, the WIA wishes positively to use this mode, and several Divisions currently either run amateur radio bulletin board

services or regularly contribute to them.

Intangible

It is a fact of life that people's interest in a matter diminishes the less they believe it affects them directly, and amateur radio is no exception.

Starting at the highest level, the major WARC's occur about every 15 to 20 years. They create a peak of interest during the build up phase before the meeting, often related to frenzied fund raising activities to support a delegation to Geneva to "retain our bands". The results of the WARC, whilst far reaching, are often slow to filter down to the ordinary operator and they are frequently delayed in implementation. For example, we have only just received one of the major gains of WARC79, that is the exclusive use of the 18 and 24 MHz amateur bands.

For those who would say "I don't need international representation", I would reply that you cannot confine your emissions within national frontiers. Furthermore, were it possible to so confine your radiation, you would quickly become dissatisfied with your hobby.

Continued on page 8

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910
Representing Australian Radio Amateurs - Member of the International Amateur Radio Union
Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic. 3161
All mail to: **PO Box 300, Caulfield South, Vic. 3162** Telephone: (03) 528 5962 (03) 523 8191
Fax: (03) 523 8191 (Non-dedicated line)

General Manager and Secretary: Bill Roper VK3ARZ

EXECUTIVE

President:
Vice Chairman:

Peter Gamble VK3YRP
Ron Henderson VK1RH
George Brzostowski VK1GB
Brenda Edmonds VK3KT
Bill Rice VK3ABP
David Wardlaw VK3ADW

VK1 Federal Councillor:
VK2 Federal Councillor:
VK3 Federal Councillor:
VK4 Federal Councillor:
VK5 Federal Councillor:
VK6 Federal Councillor:
VK7 Federal Councillor:

Kevin Olds VK1OK
Peter Jeremy VK2PJ
Peter Mill VK3ZPP
David Jerome VK4YAN
Bill Wardrop VK5AWM
Neil Penfold VK6NE
Joe Gelston VK7JG

Immediate Past President:

FEDERAL CO-ORDINATORS

Amsat:
Awards Manager:
Contest Manager:
Education:
EMC:
Historian:
Intruder Watch:

Graham Ratcliff VK5AGR
Ken Gott VK3AJU
Frank Beech VK7BC
Brenda Edmonds VK3KT
Hans Ruckert VK2ACU
John Edmonds VK3AFU
Gordon Loveday VK4KAL

Int'l Travel Host Exch:
QSL Manager (VK9, VK0):
Standards & FTAC:
Tapes (Federal News):
Widenet:
WICEN:

Ash Nallawalla VK3CIT
Neil Penfold VK6NE
Rob Milliken VK1KRM
Bill Roper VK3ARZ
Ron Fisher VK3OM
John Ingham VK5KG
Bill Wardrop VK5AWM

1990 Member Fees

During the first week of December, almost 6000 members of the WIA will receive renewal notices for their membership subscription.

As has been detailed and discussed in Amateur Radio magazine and on Divisional news broadcasts over the past 7 months, WIA membership fees for 1990 have increased considerably in a "catch-up" jump to compensate for the lack of CPI increases over the past 10 to 15 years, and to improve member services.

Much chopping and changing of the proposed 1990 fees took place as Divisions met again and again in an attempt to ensure that every aspect of financing the operation of the

WIA NEWS

BILL ROPER VK3ARZ GENERAL MANAGER & SECRETARY

WIA was minutely examined.

The final result can be seen on page 3 of December issue of Amateur Radio magazine, with the maximum fee for full membership of a majority of Divisions being \$65.00.

You will also notice a new grade of membership. After much discussion, and following many requests from both individual members and Divisions, there is now available a new, inexpensive grade of membership of the WIA whereby you can be a member receiving all the normal benefits of membership, but **WITHOUT RECEIVING AMATEUR RADIO MAGAZINE**.

This particular subscription varies with some Divisions. For example VK1, VK3, VK4, and VK5/8 provide this new grade of membership for only \$39.00, with VK2 charging \$33.00, VK6 \$30.00 and VK7 charging \$38.00.

You will also note that, as from 1st January 1990, there will be only three levels of membership subscription. F, or Full member; G, which is the Pensioner or Needy member, combined with S, the Student member; and X, the new non-AR membership which used to be available only to family members.

The three year membership

is still available to F and G members **ONLY** on payment of an amount equal to three times the relevant fee (and, in this regard, please note that there is no two year membership available).

As a matter of interest, the break up of the Federal component of the full membership fee is as follows:-

Amateur Radio Magazine	\$30.00
Federal Executive	\$16.25
IARU component	\$ 0.75
International	\$ 2.00
Total	\$49.00

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers	Weekly News Broadcasts		1990 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Ted Pearce Secretary Jan Burrell Treasurer Ken Ray	VK1AOP 3.570 MHz VK1BR 2m ch 6950 VK1KEN 70cm ch 8525 2000 hrs Sun	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 AM/SSB, 7.146 AM (1100 only) 28.320 SSB, 52.120 SSB 52.525 FM 144.12 (SSB) VK2CXZ 147.000 FM(R) 438.525 FM(R) VK2KFU 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) \$65.00 (G) (S) \$52.00 (X) \$39.00
VK2	NSW Division 109 Wigram St Parramatta NSW 2124 (PO Box 1066 Parramatta) Phone (02) 689 2417	President Roger Hanley Secretary Peter Balnaves Treasurer David Horstall Mon-Fri 11.00 - 14.00 Wed 19.00 - 21.00	VK2ZIG VK2CXZ VK2KFU		(F) \$59.00 (G) (S) \$47.00 (X) \$33.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Jim Linton Secretary Barry Wilton Treasurer Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) \$65.00 (G) (S) \$52.00 (X) \$39.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President David Jones Secretary John Aarsse Treasurer Eric Fittock	VK4NLV VK4QA VK4NEF	3.605 MHz, 7.118, 14.342, 18.132, 21.175, 28.400, 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) \$65.00 (G) (S) \$52.00 (X) \$39.00
VK5	South Australian Division Thebarton Rd West Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Don McDonald Secretary Hans van der Zalm Treasurer Bill Wardrop	VK5ADD VK5KHZ VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT) 3.555, 146.500, 0900 hrs Sunday	(F) \$65.00 (G) (S) \$52.00 (X) \$39.00
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 474 2626	President Alyn Maschette Secretary Bruce Hedland Treasurer Thomas	VK6KWN VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) \$56.00 (G) (S) \$45.00 (X) \$30.00
VK7	Tasmanian Division PO Box 1010 Launceston TAS 7250	President Mike Wilson Secretary Bob Richards Treasurer Peter King	VK7ZWW VK7NRN VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7WRN), 3.570, 7.090, 14.130, 52.100, (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) \$63.00 (G) (S) \$50.00 (X) \$38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).			Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	
Note: All times are local. All frequencies MHz.					

Planning for WARC 92

WARC 92, an Administrative Radio Conference of the International Telecommunication Union (ITU) to be held in Spain, in 1992, will have on its agenda re-allocation of certain parts of the radio frequency spectrum. An Administrative Radio Conference is a meeting of member countries of the ITU which has the power to amend the International Radio Regulations which are in the form of a treaty between the countries which sign the Final Acts of the Conference.

At the WARC each member country has one vote, and has the right to speak. Recognised international agencies such as ICAO, IART, and IMCO are also allowed to attend but can only speak by invitation. The International Amateur Radio Union (IARU) is a recognised international agency, and therefore is allowed to attend a WARC.

The main work of a WARC is carried out by committees which are further divided into working groups. These committees and working groups often meet simultaneously in order to cover the detail of the agenda as quickly as possible. The final text has to be passed by a plenary of the WARC.

In WARC 79 there were nine committees and one of those, the committee dealing with allocation of frequency matters, was further divided into six different sub-committees dealing with different parts of the spectrum.

As can be seen, the manner in which the best interests of the amateur radio service can be served, is to have at least one amateur as a member of the national delegation.

In 1959, the late John Moyle was an observer on the Australian delegation to WARC 59. As John was not a full member of the Australian delegation, his participation was limited, but it was still a breakthrough for the WIA and the amateurs of Australia.

In 1979 David Wardlaw,

VK3ADW, and Michael Owen, VK3KI, were full members of the Australian delegation to WARC 79, and thus were able to participate fully in the discussions. With two amateurs as part of the Australian delegation, it was possible to cover a great deal more of the matters of concern to the amateur service.

The Australian official preparation for WARC 79 was spread over more than three years. The WIA's preparation for WARC 79 was spread over an even longer period.

Now we have WARC 92 looming ahead, just over two years away. Although we understand that this will be a limited WARC (at just over four weeks in duration it will be much shorter than WARC 79), it will still cover frequency allocation in areas which include amateur bands on both HF and UHF.

The WIA has made a decision to fund at least one delegate on the Australian delegation, and it is understood that this is acceptable to the Australian administration.

Preliminary costings are being prepared at the present time. When considering these costings, it is imperative to realise that an amateur delegate must be on an equal footing to the other delegates as far as expenses are concerned, if he is to be completely effective.

The WIA has been invited to join the Australian Preparatory Group for WARC 92 which is to be convened early in 1990. This is the official Australian group which prepares Australia's position and forwards proposals on the issues under consideration at WARC 92, and also studies the proposals from other administrations.

In the light of experience gained at WARC 79, it is essential that the WIA, representing the Australian amateur service, should have a minimum of two representatives to attend all meetings of the Australian Preparatory Group, and be part of the Australian delegation to WARC 92.

These representatives will need to have a comprehensive knowledge of the requirements of the amateur service, both

nationally and internationally, a knowledge of the other services that use the radio spectrum and how their proposals may affect the amateur service, and a knowledge of the existing ITU Constitution, Convention and Radio Regulations.

To achieve this, and to provide the maximum possible effort to protect the amateur bands, the WIA needs the support of every amateur in Australia. Only as a strong, financially viable organisation, representing the majority of active radio amateurs in Australia, can we hope to protect our amateur service interests.

Repeater Cross Linking

Wow!! What a storm of controversy! The subject of cross band linking of repeaters, a matter which only affects a small percentage of radio amateurs in Australia at the present time, has been the cause of a great deal of misunderstanding and ill-informed comment amongst the Australian amateur community in recent weeks.

Let me try to detail briefly the chain of events without becoming embroiled in the technical arguments.

Cross band linking of repeaters has been under contemplation and discussion in the amateur service for quite some time. DoTC and the WIA started discussions in April 1988, immediately after DoTC announced approval for Novice operation on 2 m, because of the concern that a Novice licensee's transmissions could be re-transmitted by a linked repeater with output on a frequency for which the Novice was not licensed to operate.

As a result of discussions at the Executive meeting on 17th and 18th June 1989, the Federal Technical Advisory Committee (FTAC) wrote a letter to all WIA Divisions answering some queries raised about repeater cross band linking and the apparent differing interpretations of "regulations" between states. The WIA attitude was to oppose any individual approach

to DoTC to seek more detailed interpretation because this inevitably seems to lead to tighter conditions in direct contradiction of de-regulation.

At the WIA/DoTC Joint Meeting on 25th July 1989, DoTC asked for the WIA's comments on tone access switching for operation of cross band linked repeaters. The WIA impression at this stage was that the matter was important, but not urgent, and there was plenty of time to explore all the ramifications of the problem.

Therefore, following the delayed release of the minutes of this meeting, FTAC again wrote to all Divisions on 12th September requesting comments on the matter so that it could be discussed at the Executive Meeting scheduled to be held over the weekend of 7th and 8th October. Regrettably, this meeting had to be postponed because several Executive members would have been unable to attend because of the airline dispute.

Towards the end of September DoTC advised the Executive Office by telephone that it needed a response by the end of the month because it was being pressured by a repeater licensee to grant a licence for a cross band linked repeater.

Between 26th and 28th September, FTAC telephoned all Divisional Federal Councilors to hasten along their decisions. The end result was that all Divisions agreed with the concept of tone access switching for operation of cross band linked repeaters, with several indicating a preference for the CTCSS method.

The Chairman and other Canberra members of FTAC then decided that the method of tone access switching should be by 1750 Hz tone burst. This resolution was relayed to DoTC in a letter dictated to the General Manager and forwarded to Canberra DoTC on 7th October 1989.

This decision by FTAC to recommend tone burst was constitutionally correct, and did not have to be referred back to the Divisions. However, with hindsight, and particularly in view of the technical complexi-

ties of the matter, the WIA Executive should have withstood the pressure from DoTC for such an urgent decision, and referred the question of the method of tone access switching back to the Divisions.

And this is where the misunderstandings occurred. Particularly when, because of a communication misunderstanding between FTAC and the Executive Office, the news release from the WIA incorrectly stated that the decision to recommend tone burst access was a majority vote of the Divisions and interested parties.

Then, amongst all the tumult and emotive shouting, it became apparent to Executive that "Murphy's Law" was well and truly in operation. Although the WIA and DoTC had been talking all along about control of cross band linking of repeaters only in those circumstances where the output of the cross linked repeater would transgress the terms of the amateur operators licence (eg Novice licensee being re-transmitted on 432 MHz), the ruling by DoTC extended the tone access switching of repeaters to all linked repeaters, whether they were cross band or not!

Further difficulties stemmed from the wording of the DoTC ruling. Taken literally it meant that some existing repeater system management control functions were now of dubious legal status!

Following a discussion by Executive, including all Divisional members of Executive per medium of a nationwide telephone conference hookup, a four page fax letter of 26th October 1989 was sent to all Divisions by the Federal President, Peter Gamble, VK3YRP. This fax explained the circumstances, provided background material, and advised that a meeting had been arranged with DoTC in Canberra on 9th November 1989 to re-negotiate the matter of tone access control of cross band repeater linking. Divisions were asked to provide their detailed recommendations on the method of tone access switching as soon as possible.

That meeting with DoTC took

place on Thursday, 9th November 1989 between Peter Gamble, George Brzostowski and Rob Milliken from the WIA, and Alan Jordan and Wayne Huxley from DoTC.

As a result of the meeting, DoTC indicated that it would be prepared to consider sympathetically, an approach from the WIA which proposed the use of standard tones, whether they be CTCSS, DTMF or tone burst, for repeater control functions. Further, control on repeater linking would only be mandatory for cross band linked repeater systems where there is the possibility of an amateur operator transgressing the terms of his licence.

A submission is being prepared for consideration by Executive members from all Divisions at the Executive meeting to be held over the weekend of 18th and 19th November 1989.

As the "crisis" seems to be resolved, and we wait for the next one, we should pause for a moment and reflect on what can be learnt from this matter.

Perhaps it has pointed up the fact that private submissions to DoTC for rulings do have the power to throw spanners into the works. Also, that as communicators, amateurs sometimes do not communicate very well with each other either at an individual level, or at Divisional and Executive level.

And, further, that the WIA should not allow itself to be pressured into rushing a decision on such a complicated technical matter. Nevertheless, it is encouraging for the future of amateur radio in this country to note that, when the chips were down, the Divisions and a great number of WIA members rose to the occasion with constructive criticisms and suggestions, and assisted the WIA Executive satisfactorily to resolve the situation.

Amateur Growth In VK

The DoTC official statistics for Radiocommunications Li-

cences current as at 30th September 1989 are just to hand. Statistics can be boring, but the figures in this report make for some interesting interpretation, and for some concern.

Amateur radio has a marvelous history of achievement and I believe that radio amateurs will continue to benefit mankind, not only technically, but also in the increasingly important area of international friendships and understanding. However, many national radio amateur societies are currently very concerned about the lack of growth in the hobby, which could lead to difficulties for the amateur service in the future.

In the 12 months to 30th September 1989, the amateur licensees in Australia increased by only 94 from 18026 at 1st October 1988, to 18120. This is a growth of only .52%, and is surely a matter of concern!

In this year to 30th September 1989, Novice numbers decreased by 67, and AOCPLicensees increased by 166. Victoria had the biggest increase in total amateurs, increasing by 99 to a total of 5022, but NSW still has the highest number of amateurs with a total of 5274, even though there was a decrease of 135 in the past 12 months.

Amateur Radio Publicity

Publicising amateur radio is more necessary now than it ever was before. Every radio amateur in Australia, whether a member of the WIA or not, has a role to play. It would be wrong if the WIA did not emphasise the importance of individuals and amateur radio clubs who help our hobby by showing-off the best in amateur radio.

One such instance occurred recently because of the terrible earthquake damage to San Francisco. Amateurs in Australia, many of them members of IARN, provided invaluable service by passing health and welfare messages and enquiries to and from the stricken area. And, for a change, the media seemed to keep its cov-

erage of the radio amateur involvement accurate and informative.

Much of the credit for this excellent local media coverage of the importance of amateur radio in a disaster situation like the San Francisco earthquake must go to the tireless Sam Voron, VK2BVS, and his IARN team which included, amongst many others, Ken Richards, VK3CKK, Harry Brown, VK6AP, Ray Gray, VK6RQ, and Phil Evans, VK2KEV. Well done!

1990 Call Book

The 1990 Australian Radio Amateur Call Book has proved to be a great success, and a substantial improvement on the 1988 Call Book. Supplies of the limited edition of this invaluable reference work are dwindling rapidly, and it seems possible that many amateurs may miss out.

If you have not already obtained your copy of the 1990 Call Book, could I suggest you hasten to contact your Divisional Bookshop before supplies run out.

The 1990 Call Book is available for the concessional price of \$8.50 to WIA members, plus postage where applicable.

Exam Question Banks

Amateur examination development has taken another big step towards being a reality according to a letter received from the DoTC Examinations Officer, Keith Carr-Glynn, which enclosed the Question Bank for the Regulations Examination, to join the Question Banks already received for the AOCPL and Novice Theory Examinations.

DoTC stresses that this Regulations Question Bank can only be used for examinations **AFTER 21ST FEBRUARY 1990**. Until then, the old system still applies and DoTC examinations have been written

using the old syllabus.

DoTC also advises that, with the comprehensive assistance of Marshall Emm, VK5FN, of the Adelaide Hills Amateur Radio Club, it expects to be able to distribute to approved examining bodies in the near future, a compiled dBase III Plus program which will be able to be used to generate and print examination papers for use in Amateur examinations.

As Keith put it so aptly in his letter, we are rapidly approaching the end of an era with amateur examinations having been distilled down to a floppy disk and four books. And the beginning of a new era, where the continuing success and high standards of the Amateur Service in Australia will shortly be in the hands of the Amateur Service itself.

When devolvement of amateur examinations comes into effect early next year, it will be an important and vital step in the continuing deregulation of the Australian Amateur Service.

ABC Gets it Wrong

Despite the considerable efforts by the WIA, radio clubs and individual amateurs over the years to educate the print and electronic media to the very real differences between radio amateurs, users of the Citizens Band service, and illegal users of the radio spectrum, most of the time the media seems to get it wrong.

It's strange, but when the amateur service is providing beneficial services to the community in times of emergency, such as the recent San Francisco earthquake, the media seems to get it reasonably right, if you make some allowances for use of journalistic licence.

However, when some operator from another radio service, licensed or not, causes problems, the media seems to immediately lump all such occurrences under the headlines of "amateur radio operators" or "radio hams", etc..

The latest national blunder

of this type by the media was included in the highly rated ABC TV show "The Investigators" in their program transmitted on 7th November 1989.

The Executive Office was inundated on Wednesday, 8th November 1989, with telephone calls and faxes from amateurs all around Australia protesting at the program's implication that amateur radio operators were responsible for foul language appearing on the 27 MHz band, which we all know is a band now used by the Citizens Band Radio Service.

The Federal President, Peter Gamble, VK3YRP, immediately faxed off a formal letter of complaint to the producer of "The Investigators", to join the many other protest letters and faxes sent by WIA Divisions, radio clubs, and individual radio amateurs.

In an initial telephone conversation from the Executive Office with the producer of the show, it was obvious that the error was made in ignorance. It was explained to the producer that, although the word "amateur" cannot normally be claimed exclusively by any group to have a distinctive and specific meaning, apart from the dictionary definition of the word, when it is used in conjunction with radio communications, the word "amateur" most definitely does take on a very specific and legal meaning.

This specific meaning is not only clearly spelled out by the specialised agency of the United Nations, the International Telecommunication Union (ITU), but also in the Australian Radio Communications Act.

It is expected that a clarification of, and an apology for, the use of "amateur radio operators" in the incorrect context will be made in the next televised production of "The Investigators" on Tuesday, 14th November 1989.

WICEN Use of Bands

Comments heard on air after a recent Wireless Institute Civil Emergency Net (WICEN) exer-

cise suggest that there is more need for communication between WICEN and the general amateur, and more need for understanding by the general amateur of the vital role played by WICEN.

It can be irritating to commence a regular "sked" on a particular frequency, only to be told "this frequency is in use for a WICEN exercise, please QSY". Fortunately, most radio amateur operators are prepared to oblige, and do so willingly.

But problems do arise when the amateur perceives the request to have been made offensively or tactlessly. Tolerance on both sides is essential, but more support is gained if the activities which will tie up frequencies are advertised well in advance. In addition, such publicity may well attract an audience, some of whom may become interested in becoming involved in future activities.

Divisional news broadcasts, and Amateur Radio magazine, are obvious vehicles for advance publicity of WICEN, or other, exercises.

For example, two events known to be taking place during December 1989 are the Great Victorian Bike Ride, and the Murray River Canoe Marathon.

The Bike Ride starts at Yarrawonga on 2nd December, runs for 9 days, and will be using 2m repeaters VK3s RGV, RML, RNE and RMM.

The Canoe Marathon runs from 27th December at Yarrawonga to 31st December at Swan Hill. The main frequencies to be used will be 3.600 MHz and 146.500 MHz, with the possibility of using VK3RWP on 147.300 MHz.

In both events other frequencies, including UHF, may be used if the situation requires them. Please be tolerant if your favourite frequency is unavailable for a short time.

1296 MHz Band Plan Approved

UHF enthusiasts have been wanting a change in the existing WIA 1296 MHz band plan for some time. At the 1989 WIA

Federal Convention, it was decided that, subject to the Civil Aviation Authority (CAA) accepting the existing guard band for airport radar, the WIA would adopt the new VK4 recommended band plan, as it provided the greatest flexibility for all modes of operation and experimentation on the 1296 MHz amateur band.

The existing 1296 MHz band plan is published as Plan A on page 31 of the 1990 Australian Radio Amateur Call Book, and the proposed new band plan is shown as Plan B on the same page.

Subsequent to the Federal Convention, approaches were made to CAA seeking their approval for the new band plan.

A reply has been received from L N Tate, the Manager Communications Engineering of CAA which reads...

"I have discussed your revised Band Plan with our Radar Section, who see no problem at this time.

You may be aware that the Authority has just committed substantial funds to the updating of existing and installation of new radar sites, to give coverage along the eastern seaboard of Australia from Cairns southward. This contract will see over the next two years the removal of existing radars from the 1270 - 1280 MHz band, therefore, if the users of the 1296 MHz Amateur band cause no interference as a secondary service to the Authorities' radar during this period, we have no objection to the new band plan."

In view of this approval, it is expected that the WIA Executive, at its next meeting, will formally adopt and announce the changeover to the new band plan.

DOC 70 Available

The last of the three pamphlets produced by DoTC to replace the old Amateur Radio Operators Handbook is now available free from all DoTC Communications Operations Division Offices.

DOC 71, Licence Conditions and Regulations applicable to

Continued on page 44

4 STORE BUYING POWER

ROTATORS!

Make	Model
KENPRO	KR400
KENPRO	KR400RC
KENPRO	KR500A
KENPRO	KR800
KENPRO	KR2000
KENPRO	KR5400B
CREATE	RC5-1
CREATE	RC5A-3
CREATE	RC5B-3

ROTATORS!

Braking
1530kg/cm
1500kg/cm
Elevation Rotator
4000kg/cm
10,000kg/cm
Azimuth/Elevation
7000kg/cm
15,000kg/cm
20,000kg/cm

ROTATORS!

Rotation	Price
400kg/cm	\$369
400kg/cm	\$429
800kg/cm	\$659
2000kg/cm	\$1299
600kg/cm	\$899
1600kg/cm	\$575
2,200kg/cm	\$1199
	\$1730

FIRST SHIPMENT SOLD

Next shipment due Nov.
NEW from A.E.A.
MM3 MORSE MACHINE



Featuring

- 2.99 WPM speed selection
- 20 memory channels
- 8000 character storage
- RS232 compatible
- Programmable auto beacon
- Random word generator
- QSO simulator
- Fully featured keys

ONLY
\$425

PERTH OPENING SPECIAL

Never to be repeated!
DAIWA ROTATORS Model
MR 750
Braking 6000kg/cm rota-
tion 700kg/cm
ONLY \$399



TOKYO HY-POWER

LINEAR AMPS 2 mtrs	JUST ARRIVED
	was now
HL 180V auto	\$599 \$545
HL 160V/25	\$499 \$475
HL 85V	\$339 \$299
HL 130U	\$799 \$769
6 mtrs	
HL 66V	\$299 \$279

NEW **JRC**
NOW IN STOCK



JST 135-150 watts

- * The ultimate HF Transceiver
Price \$3199
- * Built by the professional for the
connoisseur.

**NRD 525
Receiver**



- * Superb performance
- * Quality Manufacture
- * 200 memories
- * VHF/UHF option avail.
- * RS 232 option avail.

PRICE
\$2599

ICOM

SPECIAL - IC28A only \$499

ALL ICOM PRODUCTS, COMMERCIAL
AND AMATEUR ARE AVAILABLE FROM
EMTRONICS.

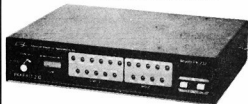
Contact us for Australia's most competi-
tive prices!

JOIN PACKET

New PK-232 Breakthrough including PMS**

A new software enhancement makes the AEA PK-232 the only
amateur data controller to offer six transmit/receive modes in a
single unit.

★ Morse Code ★ Baudot (RTTY) ★ ASCII ★ AMTOR ★
Packet ★ Weather FAX



PK 88 VHF modem

PRICE
\$640
incl FAX

\$299

**AEA
Isopoles
2m &
70cm**



2mtr
\$145

70cm
\$199

KENWOOD

Full range of all Kenwood products
available at competitive prices from our
4 stores!!!

REVEX SWR & POWER METERS

W560 \$299	W570 \$350
1.8-525MHz	1.8-1300MHz
3W/20W/200W	5W/10W/200W

THESE PRECISION HIGH QUALITY
METERS EMPLOY REVEX EXCLUSIVE
WIDEBAND COUPLERS & PROVIDE
LABORATORY GRADE PERFORMANCE.

BANKCARD
MASTERCARD & VISA
WELCOME

NSW & HEAD OFFICE:

92-94 Wentworth Ave. Sydney
NSW 2000. TLX: A473990
PO Box K21 Haymarket. NSW 2000
Ph: (02) 211 0988 FAX: (02) 281 1508



EMTRONICS

VICTORIA:

288-294 Queen St. Melbourne
Vic 3000
Entrance from LT Lonsdale St
Ph: (03) 670 0851 or 670 0330
Fax (03) 670 0671

QUEENSLAND:

416 Logan Road. Stones Cnr
Qld 4120
Ph: (07) 394 2555
FAX: (07) 394 4316

WESTERN AUSTRALIA:

336 Albany Highway
Victoria Park WA 6100
Ph: (09) 470 1118

MAIL ORDERS
WELCOME

Message from Peter Gamble

Continued from page 2

Negotiations with national authorities are similar. One could cynically say the Department's name changes more frequently than major circumstances affecting amateurs! In the last forty years there have been only a few momentous changes such as limited licences, novice licences and a new RADCOM Act, all of which involved close liaison with the WIA.

The changing mode of national government has also meant a change in the method of negotiation with the administration. Negotiation, public involvement and the importance of representational groups or societies are all key factors.

The WIA provides a combined or coherent voice for the majority of Australia's active radio amateurs. The remainder contribute only a few uncoordinated views, due to a mixture of apathy by the greater number coupled with extremist views of a fairly vocal minority. Sadly, this last group make inordinate demands upon the Department's limited resources and lead DoTC to suggest and wish they would work through the WIA. In these times of "user pays government" often the silent majority bear the expense of the vocal minority in the form of increased licence fees!

Since non-members reap the benefits of all WIA/DoTC nego-

tiations you might ask "Why belong when I can get it anyway?"

This is true, but why should these amateurs "bludge" on their fellow amateurs who are prepared to support their hobby. And, of course, the WIA can only improve its bargaining position with government if it can confidently state it represents the interests of a majority of active radio amateurs.

Fair Go

Australians have always been the champions of giving the little man a fair go. We often refer to the "little Aussie battler". The WIA also believes in this view. It wishes to see all amateurs get a fair go, to see they are given a voice in the management of their hobby and are not subject to any oppressive "big brother" influences.

But the WIA feels that this approach has accompanying, reciprocal responsibilities, responsibilities which need to be seen and counted. Australian radio amateurs must share some of the volunteer workload of managing our hobby, and ultimately share the not insignificant cost of these activities.

Cost of Membership

Having introduced the crutch words "cost" and "money", let us look a little more closely at the funding involved.

Over the last twenty years the WIA, both Federally and Divisionally, has gone through some financial ups and downs. We had our difficult times with galloping inflation in the 70's and gained some respite, unfortunately mainly illusionary,

with the high interest rates of recent years.

The WIA has been managed by volunteers with sometimes less than adequate business acumen who have, for the best of motives, held down subscriptions to less than the prevailing inflation rates with the aid of interest from investments. We have also extended ourselves at times, entered into activities without determining their long term escalating and recurring costs, and never properly examined their cost effectiveness.

The Federal body has recognised many of these problems and identified them as issues in the preparation of its corporate plan. We hope, in due course, to implement measures to alleviate these problems by supporting and guiding our many volunteer officers.

I mentioned earlier the volunteer support. That support is essential to keep the WIA functioning. However, as an organisation we have too often prevailed upon a few willing workers to remain in office for far too long, allowing them to get tired, frustrated and not able to contribute their best. This has been to our ultimate disadvantage.

In years gone by, when life was not as hectic, it was common for the secretary of, say, a sporting club or hobby society to remain in office for 20 or more years with no reward, a little praise, much abuse, an honorarium of 20 guineas and perhaps a medal at the end of it all! Today's life style calls for a different type of volunteer officer, one who serves for a much shorter period but, when compared with the past, at a more hectic rate. The result is that "burn-out" occurs if he or she is

not rested and replaced after a few years. The WIA needs to tap the great pool of business management acumen in its ranks to share the tasks of administering amateur radio in Australia.

Indeed the WIA is appealing to all amateurs' sense of "giving things a fair go" to come forward and contribute actively and positively in return for your privilege of using many megahertz of that valuable, finite resource, the radio frequency spectrum.

Conclusion

I hope, as you think about these things, you will agree with me that being a member of the WIA is value for money and that you will continue to renew your membership.

If you are one of the many non-members who read "AR" from time to time, perhaps you will consider joining us.

As we approach WARC92, the WIA needs to make sure that we are united on the key issues and have the support of the majority of active amateurs in Australia.

Remember, also, that there are many ways in which you can help our hobby, whether it be at a local club level, Divisional level or at the Executive level. This is an opportunity to enjoy so much.

On behalf of the Executive, and the staff of the Executive Office, I would like to extend Seasons Greetings to you, and may 1990 be a challenging and exciting year for you.

Peter Gamble

Try This

Patient: Kenwood T S 820 S, approx 9 YO.

Symptoms: Very erratic digital readout, with audio blanking.

Diagnosis: Dust between plates of VFO tuning capacitor.

Special

Instruments: Household vacuum cleaner (hose type).

Procedure:

1. Apply electrical tape to nozzle of vac cleaner for efficient seal.
2. Remove top cover of T S 820.

3. Switch on rig.
 4. Apply nozzle of vacuum cleaner to 3/16" (4.8 mm) hole on top of VFO Shield Cover.
 5. Whilst observing readout, rotate dial full travel in both directions, rocking at bad spots.
 6. Continue until symptoms disappear maybe 5-10 mins.
- Prognosis:** Complete recovery.
Note: The above procedure recommended before onerous exploratory operation.

R MacDonald VK4ARM

ar



EMTRONICS

THE AUSTRALIAN RADIO COMMUNICATION CENTRE!

EMTRONICS OPENS IN WA

FROM DEC 1st 1989 EMTRONICS (W.A.) Pty. Ltd. WILL BE IN ITS NEW MODERN PREMISES AT: 336 ALBANY HIGHWAY, VICTORIA PARK W.A., 6100. PH: (09) 470 1118

NEW 1KW EMTRON TUNER EAT-1000A Only \$550



This new EAT-1000A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available. 5 position internal antenna switch, cross needle SWR/power meter, built in 3:1 balun for open feedline and antenna terminals for coax line, open feedline as well as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price professional design and quality that EMTRON provides. MADE IN AUST.

NEW 300W EMTRON TUNER EAT-300A Only \$369



The finest 300 watt antenna tuner on the market with quality that only EMTRON can provide! Unique features such as:
● Cross needle SW 12/forward & reverse power meter ● Built-in 100 watt dummy load ● Antenna switch including bypass ● Built-in 1:4 balun for open feedline ● Lowest price & professional design ● Matches everything from 1.8-30 MHz ● Made in Australia by Emtron

OVER 3000 FAMOUS EAT-300 SOLD



EMTRON'S fastest selling 300 watt antenna tuner with SWR meter, built in 1:4 balun, heavy duty ceramic switch and top grade components. Works with all rigs and is found in Amateur, Commercial and Marine services.

Only \$259

FOR SWL EMTRON DESIGNED ETP-1



Antenna Tuner & Low Noise Amplifier For Receivers

ETP-1 will match your antenna to your receiver for maximum signal from MW to SW. It utilizes a low noise 12dB gain preamplifier to boost weak signals. Special spring loaded long wire terminals as well as SO239 connectors make ETP-1 the most versatile tuner/amplifier on the market.

ONLY \$159 & \$10 P&P

EMTRON'S PRECISION CROSS NEEDLE RF EP2000 SWR METER



Yes this new from EMTRON — highly accurate CROSS-NEEDLE SWR & POWER meter, model EP-2000 with a freq range from 1.8 MHz to 60 MHz and power ratings 20, 200 watts, gives instantaneous readings of forward/reverse power and SWR plus 2 kW.

ONLY \$110

NEW from EMTRON



Professionally made noise bridge for all kinds of RF measurements: antenna adj, etc.

NOISE BRIDGE with EXPANDER EBN-2 \$129 & \$10 P&P

EMTRON'S NEW HF SWR METER EP-1



Specially designed with PRICE, QUALITY AND ECONOMY IN MIND. Freq range from 3.50 MHz. Reads forward and reflected relative power. Ideally suited for amateur and CB services.

\$59 & \$7 P&P

New THE ED 5-2C DIPOLE MULTI BAND TRAP ANTENNAS



- Completely factory assembled ready to use
- Heavy 14 (7/22) gauge standard copper antenna wire to survive those severe storms.
- Centred tuned feedline supplied
- Only two traps
- Includes centre insulator with an eye hook for centre support.
- Includes custom insulators molded of top quality material with high dielectric qualities and excellent weatherability.
- Complete installation instructions included
- Overall length 33 mtrs less when erected as an inverted vee or sloper
- Handles 2 kw PEP & covers 80 through 10 metres.

Only \$159

BALUNS

NEW

- ★ For dipoles, yagis, inverted vees and doublers
- ★ Replaces centre insulator
- ★ Puts power in antenna
- ★ Broadbanded 3-40 MHz
- ★ Small, lightweight and weatherproof
- ★ 1:1 impedance ratio or 4:1
- ★ For full legal power and more
- ★ Helps eliminate TV
- ★ With SO 239 connector
- ★ Built-in DC ground helps protect against lightning

\$59



ANTENNA CENTER INSULATOR

- ★ Small, rugged, lightweight, weatherproof
- ★ Replaces centre insulator
- ★ Handles full legal power and more
- ★ With SO 239 connector

\$20

**EMTRON
3 band
vertical
for
10,15,20
metre
bands
ONLY
\$129**

MV-3



HB-31
Three band rotatable dipole for 10, 15 and 20-metre band for hams with a limited budget.

\$169

A VLF-LF RECEIVER - 10kHz TO 500 kHz WITH RESISTANCE TUNING

LLOYD BUTLER VK5BR
18 OTTAWA AVE, PANORAMA 5041

Introduction

Few communications receivers tune to frequencies below 500 kHz and because of this, many radio enthusiasts are unfamiliar with this section of the radio frequency spectrum which supports numerous radio services.

Likewise, the writer had no receiver which could tune these frequencies and set out to design a simple receiver for just that purpose. The superheterodyne receiver described is the result. It has been designated a VLF-LF receiver, because it tunes the VLF-LF range from 10 to 300 kHz, but it also tunes part of the MF spectrum from 300 to 500 kHz. The VLF and LF bands have their own unique useful characteristics and these will be discussed further on.

The receiver design is a little different from the usual form. It has no variable capacitors or inductors except for one preset trimmer in a trap circuit. Tuning is carried out by a potentiometer, the resistance of which sets the frequency of the heterodyne oscillator. The RF end is untuned and the receiver bandwidth is set by two inexpensive ceramic filters in the IF channel. All inductive elements are provided by stock lines of miniature RF chokes.

Because of the low frequencies involved, it has been possible to use a number of excellent integrated circuit packages which would be unsuitable on the HF bands. The circuit diagram of the receiver is shown in figure 1 and the following discussion refers to elements in that diagram.

The Mixer Stage

The mixing is carried out by an operational multiplier package type XR2208. This device is suitable for use at frequencies up to 8 MHz, and as a mixer at low frequencies its performance is outstanding. Performance tests at an input frequency of 200 kHz and an intermediate frequency (IF) of 455 kHz have produced the following results:

Conversion gain (Ratio of output level at 455 kHz to input level at 200 kHz): minus 6 dB.

Equivalent noise level at input: 10 microvolts in a 1 kHz band.

Third order intermodulation products: At input levels below 70 microvolts, products are below the noise floor. Even at 1 volt input, the third order products are 55 dB below signal level at 455 kHz.

Level of signal at the output, equal in frequency to the input signal: 33 dB below the level at the input.

Level of signal at the output, equal in frequency to the local oscillator frequency: 53 dB below the level of the oscillator at the mixer input.

The low level of third order intermodulation products adds up to a low order of nuisance intermodulation beats or "birdies". The low level of local oscillator signal in the output assists in achieving operation with the oscillator frequency close to the intermediate frequency, as is needed when tuning at signal frequencies down to 10 kHz.

The Tunable Local Oscillator

For a tunable oscillator, precision oscillator package type XR2209 was selected so that variable resistance tuning could be applied. This device can be operated at frequencies up to 1 MHz and for an R-C tuned oscillator, has the excellent temperature stability of 20 parts per million per degree Celsius. For the maximum oscillator frequency of 955 kHz required, frequency drift over a 20 degrees change is therefore only 360 Hz.

The XR2209 can be connected for either square wave or triangular wave output, the latter of which is fed to the mixer via a sine shaping filter. The filter is used to reduce the possibility of oscillator harmonics mixing with high level high frequency signals, which manage to get through the RF filter at the receiver input and produce unwanted IF beats.

The tuning is carried out by two poten-

tiometers, one for coarse tuning and one for fine tuning. The fixed tuning capacitance and the limiting resistance in series with the two potentiometers, are trimmed to obtain an oscillator frequency range of 465 to 955 kHz, which is 455 kHz higher than the tuning range of 10 to 500 kHz. The coarse tuning potentiometer is connected to a dial which is calibrated in coarse frequency. The values of resistance and capacitance have been selected to suit the full resistance range of the coarse potentiometer. If a vernier dial is used with a shaft rotation of only 180 degrees, the value of limiting resistance can be decreased and the value of fixed capacitance increased to correct for this.

RF & IF Amplification

To provide RF and IF gain, JFET operational amplifier packages type LF353 have been used. These are an 8 pin DIL package containing two amplifiers with a 4 MHz gain-bandwidth product. At the frequencies involved, a gain of 100 for each package. The RF amplifiers are actually set to realise a gain at low frequencies of 20 per unit, giving a total gain of 400. Of course, this gain decreases at the high frequency end of the tuning range.

One LF353 package is used for RF amplification and one and a half LF353 for IF amplification. The remaining odd half is used as an audio driver following detection.

The RF Circuit

The front end of the receiver is broadbanded up to a frequency of around 500 kHz above which higher frequencies are attenuated by a low pass filter. The function of the low pass filter is to reject signals at image frequency which, as it happens, fall within the broadcast band. It also rejects higher frequency signals which could mix with harmonics of the local oscillator to produce a 455 kHz IF

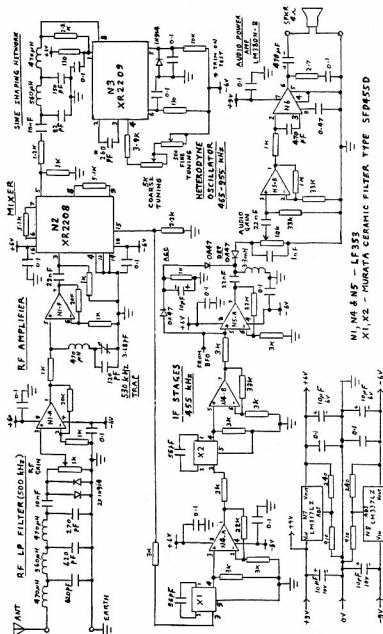


Figure 1 VK5BR VLF-LF Receiver Circuit Diagram (Refer also to fig 4 for BFO)

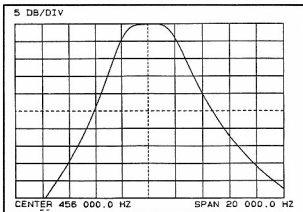
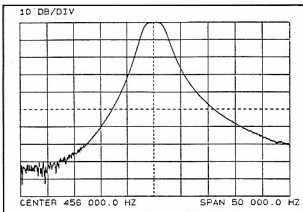


Figure 2 Intermediate Frequency (IF) Response

beat. The 3 dB cut off point of the filter is set at 500 kHz and its response is 55 dB down at the 2nd harmonic of the cut off frequency.

In the coupling circuit between the two RF amplifier stages, a trap circuit is also included. In the first instance, the receiver was made to reject signals above 420 kHz and the trap was fitted to reject direct signal pick up at the intermediate frequency. Direct pick up at 455 kHz proved to be no problem and this was attributed to the properties of the XR2208 which balance out the input signals. Furthermore, the receiver could also be tuned across 455 kHz with no undesirable effects. In consequence of this, the input filter was changed for a cutoff frequency of 500 kHz to extend the range of the receiver. The only problem with this change was that it opened up the RF end to signal entry at the extreme end of the broadcast band. Strong local station 5UV on 530 kHz mixed with the second harmonic of the heterodyne oscillator to produce a signal when the receiver was tuned to receive 37.5 kHz. Furthermore, if the RF gain was set too high, 5UV would cross modulate other signals. To eliminate this problem, the trap was set to the 5UV frequency just above 500 kHz.

The IF Circuit

The selectivity of the receiver is achieved with two Murata type SFD455D ceramic filters in the IF channel. These are a low price unit essentially made to replace 455 kHz IF transformers in transistor receivers. Using the two of these filters, the 3 dB bandwidth is 3.7 kHz and adjacent channel rejection is 47 dB at 10 kHz from centre frequency and 65 dB at 20 kHz from centre frequency. The response of the IF channel is shown in figures 2a & 2b. Figure 2b is an expanded

version of 2a. The steep slope of the IF response enables signal reception down to 10 kHz. For this tuned condition, the heterodyne oscillator runs at 465 kHz and this must be rejected by the IF channel.

The values of components connected around the filters are as suggested in the manufacturers brochure but if a wider bandwidth is desired, it can be achieved by a change in these values. The writer experimented with one of these filters and found that its bandwidth could be expanded to around 7 kHz by operating with the circuit constants shown in figure 3.

Audio Stages

The IF signal is detected by a diode and following R-C filter. The audio output is fed via the half LF353 pre-amplifier to an 8 pin version of the LM380 power amplifier. The LM380 has internal thermal limiting and using heat sinking only via the circuit board pins, it can deliver an audio power of up to 1 watt into a 4 ohm load with a power supply of 9 volts.

Beat Frequency Oscillator (BFO)

Most of the signals heard within the frequency range transmit in the AM or MCW mode and the receiver was initially wired up for only that type of reception. However, there are also CW signals on the bands, such as those transmitted by the marine coastal radio, for which a BFO is needed. A BFO is also useful for detecting the presence of some of the navigational signals such as Omega. A BFO was eventually added and this is shown in an additional diagram, figure 4.

The 455 kHz ceramic filters, used in

the IF stages, are quite inexpensive and this provided an attraction to use a third filter for crystal control of a stable BFO. Tests on the filter showed that a crystal element could be accessed between pin 5 and any of the other pins on the filter and each element gave a parallel resonance around 456.85 kHz. Pins 1 and 2 elements were found to produce a higher Q than pins 3 or 4 elements.

Another half LF353 was pressed into service to form the oscillator in conjunction with the ceramic element across pins 1 & 5 and other components as shown in figure 4. Frequency of oscillation was measured to be 456.36 kHz, which was a satisfactory offset to 455 kHz to operate the incoming signal within the 3.7 kHz IF passband and give a suitable audio frequency beat. The series inductor and shunt capacitor at the amplifier output form a sine shaping filter fitted as a precaution in case harmonics of the BFO caused any problems. The second buffer amplifier is really unnecessary, but it was given a job to do, as it was available as a spare in the LF353 package and required no extra components.

The component values shown to make the circuit oscillate were determined experimentally on a single LF353 and a

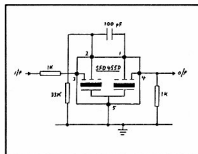


Figure 3 Ceramic Filter - Connection for wider bandwidth

single ceramic filter. This is pointed out because, in duplicating the circuit, constants in these devices (particularly the filter) might well vary in different samples, possibly resulting in the need for a change of component values in the feedback path.

Power Rails

Split power rails of plus and minus 6 volts are used for all stages except the audio power amplifier. The split rails enable precise centring of amplifier operating points making it easy to directly couple, without capacitors, many of the amplifier stages. The 6 volt rails are derived by voltage regulators type LM317LZ and LM337LZ from a nominal source of plus and minus 9 volts. These regulators are packaged in standard TO-92 transistor cases and are very compact. The regulators are needed to stabilise the voltage, in particular to the XR2208 oscillator, as its high frequency stability can only be achieved if its power rail voltages are held constant.

Decoupling of the 6V rails is used in feeding both oscillator circuits. These are running at a high signal level and the decoupling is necessary to prevent coupling into other circuits via the power rails.

The audio power amplifier is powered

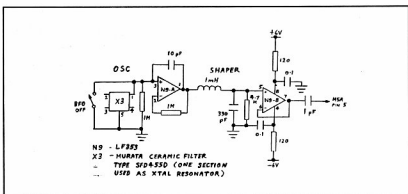


Figure 4 Beat Frequency oscillator (BFO) Circuit Diagram

directly from the positive 9 volt source and does not load the regulator.

The regulated load current is approximately 30 mA per 6 volt rail and is well within the 100 mA capacity of the regulators. The additional load current from the LM380 increases the current on the 9 volt positive supply to 37 mA in the quiescent state and to 134 mA when the power amplifier is driven to its maximum output with continuous sine wave wave signal. Under signal conditions, average current is in the order of 50 mA.

The 9 volt power sources can be two small 216 type torch batteries or twin unregulated DC supplies rectified from a

transformed AC supply. If batteries are used, the positive supply must be shunted with a 2200 μ F electrolytic capacitor to prevent the swinging load current of the LM380 from developing a corresponding voltage drop across the battery internal resistance. If the voltage is allowed to swing below 7.7 volts, the regulators cannot do their job and instability occurs. This also puts a limit on how far the batteries can be discharged before the regulated voltage fails. The possibility of instability is eliminated if a separate (third) battery is used for the LM380 so that supply to the regulators is unaffected by the LM380 varying load.

WIA 80th Anniversary Edition of the 1990 Call Book

This latest Call Book would make an ideal Christmas Present

Over 18,000 current callsign listings plus Band Plans,
Repeaters, Beacons, DXCC, etc.

DO NOT MISS OUT!

Buy your copy now from your WIA Divisional Bookshop.

Special Price to WIA Members of

\$8.50

plus postage and handling (\$1.50 approx. depending on Division.)

Overall Sensitivity

For satisfactory performance, receiver generated noise level, referred to the receiver input, must be lower than the noise incoming from the antenna. At low radio frequencies, the atmospheric noise is very high and hence receiver sensitivity does not have to be as good as that normally sought for receivers operating in the HF or VHF bands. In this receiver, the minimum discernible signal level is around 3 microvolts for frequencies below 100 kHz. Above 100 kHz, sensitivity falls because of the shaped response caused by the RF filter and the 530 kHz trap and to a lesser extent by the falling response of the RF amplifiers at high frequencies. Figure 5 plots minimum discernible signal level as a function of frequency together with a plot of atmospheric noise against frequency. The noise is that anticipated from a 10 to 30 metre antenna in a bandwidth equal to that of the receiver, or 3.7 kHz. The figures have been derived from information published in the ITT Reference Data for Radio Engineers and based on a noise level for Australia of around 45 dB above KTB at 1 MHz. Based on figure 5 and using the range of antenna lengths specified, the receiver has adequate sensitivity for frequencies up to 350 kHz. The receiver still operates up to 500 kHz, but owing to the shaped RF response, it has a considerable reduction in sensitivity as 500 kHz is approached.

Full automatic gain control (AGC) has not been provided in the RF and IF circuits, partly because the LF353 amplifiers did not quite lend themselves to control of gain and partly because ionospheric fading was not anticipated on this band. Had AGC been contemplated, gain controlled amplifiers such as the Motorola MC1590 or the Plessey SL6120 might have been a better choice for RF amplification. Because RF gain is manually controlled, some care must be taken in setting the RF gain control to prevent receiver overload when tuning to a very strong signal, such as the local airport beacon. The placing of the gain control at the RF amplifier input might appear open to question as attenuation at its input effectively degrades the receiver noise figure. On the other hand, it is the best place to control the input signal level to prevent cross modulation in the amplifier. Furthermore, at the frequencies concerned, incoming noise is generally predominant over receiver noise and the noise figure is not so important.

The main nuisance of no AGC was found to be the audio overload which occurred when shifting the tuning from a

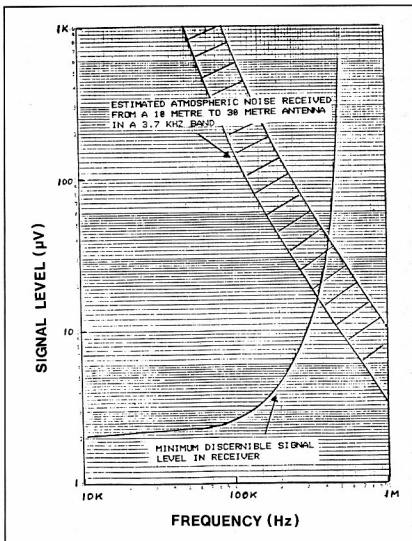


Figure 5 Minimum discernible signal level & estimated atmospheric noise level

weak signal to a very strong signal. This effect was reduced by applying a form of AGC which lowered the gain of the last IF stage on very strong signals. To achieve this, DC voltage is rectified from the IF output of the stage and is applied to a germanium diode connected at the stage input. The variable resistance of the diode acts as the shunt element of an inverted L network. The higher the signal voltage, the higher is the diode current, the lower is the resistance of the shunt element and hence the greater is the loss in the network.

One might well ask why this AGC system was not applied at the RF input as is usually done. This, in fact, was experimented with but found to encourage cross modulation from strong stations within the passband of the RF fil-

ter. This is a problem with broadband RF stages. There is no selective tuning to attenuate the level of the strong signal and the variable slope gain characteristic, needed for AGC control, is also a good mixing medium for the strong signal to cross modulate any other signal.

Alignment

The only tuned circuit is the trap. This can be aligned by feeding a modulated signal at a fairly high level into the receiver input at a frequency just above 500 kHz and adjusting the series trimmer for minimum audio output. One might choose to select the frequency of the lowest frequency local broadcast station, as did the writer. In the writer's case, the receiver was tuned to 37.5 kHz and the trap set for

minimum signal from 5UV (refer to the previous discussion in the section on the RF circuit).

The only other possible adjustment is the setting of the heterodyne oscillator frequency to cover the frequency range of 465 to 955 kHz, over the tuning range of the coarse potentiometer control. This is done with the fine potentiometer control set to centre position. Trimming of the capacitance across pins 2 & 3 of N3 and the fixed resistor at pin of N3 could be necessary to suit individual samples of the XR2209 package. Its frequency range can be checked using a frequency counter connected across its output or by feeding the receiver input with a signal generator set to the extremities of the input frequency range, 10 kHz and 500 kHz.

Notes on Assembly & Components

There is nothing particularly critical about the receiver layout except that the circuit wiring should flow from input to output in order, as is normal practice and outputs should be kept away from inputs. It is not an arduous task to hard-wire the whole unit (except for controls) on a small piece of Vero board. The writer's experimental receiver was fitted on a card space of 12 cm x 10 cm.

All the inductors used are the miniature ferrite cored types such as the Siemens range of RF chokes type 878 108-S. These are about the size of a small resistor, are colour coded like a resistor and can easily be mistaken for one. There are a few precautions to observe in mounting these chokes. Unlike toroidal cored inductors, the field around them is not confined and they should be mounted with extended leads, at least 1 cm off any metal on the circuit board, to prevent change of inductance and lowering of Q. If two of them are mounted close together, they should be mounted at right angles to reduce interaction between their fields.

As a general rule, capacitors with a low resistive component should be selected for filters and tuned circuits and this also applies to the filters and trap circuit in this receiver. Most people choose ceramic capacitors for use in their projects because of their small size, but their resistive component varies from sample to sample in a batch and it is often quite high. Unless they can be carefully selected for low resistive component, using an impedance bridge or Q meter, they should be avoided if possible. Mica capacitors are good but are usually much larger. There are some high quality ceramic capacitors made, such as the Vitramon VP31 range, but they might be diffi-

cult to obtain at the local electronics store.

The only other components, which require particular mention, are the capacitor and variable resistances used to control the frequency of the heterodyne oscillator. The capacitor across pins 2 & 3 of N3 should be a good stable type (perhaps a mica) and the potentiometers should be non-inductive with good resolution. Good quality one-watt carbon or cermet types of potentiometer are suggested to give nice smooth tuning. This is emphasised because there are some very poor potentiometers on the market today, particularly in the miniature variety. On of their faults is the high degree of mechanical backlash which seems to be caused by the elasticity of the bush sealing the shaft. Fortunately this backlash is steadied when the shaft is loaded down by the reduction gear on a tuning dial.

What Can Be Heard

The VLF and LF bands have their own unique useful characteristics. Transmission is by ground wave, virtually unaffected by reflection from the ionosphere and because of this, transmission is highly predictable and very useful for direction finding and other forms of radio navigation. Atmospheric attenuation falls as frequency is lowered and given sufficient radiated power, signals at VLF travel large distances around the earth's surface. A difficulty is the massive aerial system needed to achieve some order of antenna efficiency and hence radiated power.

Another limitation is the restricted amount of channel space, not suitable for wideband systems. For example, one television channel of around 6 MHz bandwidth, on its own, takes up 20 times more band space than the whole of the VLF and LF spectrums put together.

Radio waves are highly attenuated when passing through water but waves in the VLF region are attenuated the least. (This was discussed in an article by the writer in *Amateur Radio*, April 1987.) Because of the comparatively low attenuation, the VLF band is used for communication to submarines.

Within the Australian region, there are many strong signals transmitted in the VLF and LF band and the part of the MF band tuned by the receiver. Included in these are the following:

Omega navigation system can be heard in a frequency band of 10 to 13 kHz. There are actually five different frequencies transmitted which are switched in a certain order of eight segments in a ten

second time frame. One of the Omega stations is located in Victoria, Australia.

The North West Cape VLF station can be heard with a frequency shift of 100 Hertz between 23.25 and 23.35 kHz.

A proliferation of aeronautical homing beacons (known as non-directional beacons or NDBs) within the spectrum of 200 to 420 kHz, transmit continuous carrier with morse ident code and some also with voice aerodrome traffic or information.

Australian maritime coastal radio stations operate with CW on a range of fixed frequencies between 420 and 490 kHz and listen for merchant ships on 425, 468, 480 and 512 kHz. The maritime distress frequency is 500 kHz.

Throughout the world, there are several stations in the VLF-LF spectrum which transmit standard time and frequency. GBR (Rugby UK) is well known for its time services on 16 kHz. MSF (Rugby) also transmits on 60 kHz. At low frequencies, these typical signals are ducted around the earth in a type of wave guide formed by the D layer and the earth. With a bit of luck, one might pick up some of these.

There are various teletype services which can be heard from time to time. Of course it is difficult to identify who they are unless you can decode their signals.

In Europe, frequencies between 150 and 300 kHz are used for long wave broadcasting but at these frequencies, distances are too great for reception within Australia.

For those enthusiasts who are interested in short wave listening and identifying various stations, there is another field of endeavour in long wave listening.

Other Options

We have discussed the design of a complete VLF-LF receiver but there are a few other simple options which might be attractive to others interested in these bands. If you have an existing receiver with a 455 kHz IF channel, you could build just the RF end of the receiver described and feed the XR2008 mixer output into the second receiver IF stage, via a switch which selects either the VLF-LF front end, or the existing receiver RF end.

Another option is to use the VLF-LF RF end as a converter and feed the mixer output into the second receiver tuned at the low frequency end of the broadcast band. A frequency would have to be selected clear of strong broadcast carriers and the connecting lead would have to be carefully shielded. The capacitor across pins

Continued on page 16

MORSE CODE IS A MYTH!

MERVYN EUNSON VK4SO
Box 1513 GPO BRISBANE 4001

True, Morse never did devise the simple code that bears his name-fame (or blame) is heaped on the wrong man! Nor did he invent the electric telegraph, as commonly supposed.

Samuel Finley Breese Morse was a painter of fashionable portrait miniatures. Born in 1791 at Charlestown in Massachusetts. Known as Finley to family and friends, others addressed him as Professor (he tutored in art at the University of New York). He was without scientific learning or engineering skill.

Morse, blind to massive conflicting facts, always claimed that he alone invented the first electric telegraph in 1832, though naught was done to develop it for several years (then his efforts produced a dud!).

But as early as 1795 systems had been demonstrated using static electricity. Then after Alessandro Volta produced the first chemical battery in 1801, history's path is strewn with ingenious telegraphs applying the new electromotive force. The first commercial success, patented in England in 1837, was that of the partnership of William Cooke and Charles Wheatstone, being a direct-reading instrument with multiple line wires and five needles. Subsequently they reverted to a two-wire system and one centre-zero galvanometer needle, deflected left-right

by separate keys.

This latter method was a refinement of that pioneered in 1825 by Ludovitsch Schilling of Kronstadt, a Russian nobleman, who built a line for Alexander I between the Czar's palaces at St. Petersburg. Others effected improvements, notably Karl Gauss and Wilhelm Weber at Gottingen in 1833, as did Professor Steinheil at Munich in 1837, who discovered the principle of the earth return. But these were men of science, disinterested in pecuniary exploitation.

The apparatus of Cooke and Wheatstone served well in communications for English railway systems (no post offices existed before Rowland Hill introduced penny postage in 1840). And this, with a US patent before that of Morse, found favour in America as well.

All these early telegraphs featured an obsession with direct-reading methods, or in obtaining a visual record of the message (the very word "telegraph" means "writing from afar" and was coined in France to describe the Chappe semaphore of 1793). Strangely, in that great musical age none conceived the notion of aurally receiving a series of simple sounds. But then railway operators found divided concentration difficult in following the fluctuating needily by eye and simultaneously writing the message - it

proved easier to copy the audible "click-clack" by ear instead.

Morse the late-comer also proposed a registering system that was woefully cumbersome and impractical. Its basis was a dictionary of selected words marked with coded numbers. The message was set in words cast from printer's type with special projections, which were rendered into electrical impulses by passing under a circuit breaker. At the receiving end a crude pantograph (made from a picture frame) caused a stylus to register a serrated line. Counting the peaks converted the message into numerals, then decoded by reference to the numbered dictionary (the illustration shown reads "SUCCESSFUL EXPERIMENT WITH TELEGRAPH SEPTEMBER 4 1837"). None of this was original, for the inventor Edgeworth in 1794 used a numbered dictionary with his semaphore.

Grossly inadequate, the wretched failure along with Professor Morse would have passed into the abyss of oblivion. Among other shortcomings, it would not function beyond a line length of a few feet (he was ignorant of the law propounded by Georg Simon Ohm in 1827). As he lacked appropriate technical knowledge, Morse then sought scientific advice from Dr Gale, a university academic, who acquainted him with the discoveries of

Continued from page 15

2 & 3 of the XR2209 oscillator would also have to be decreased to shift the oscillator frequencies up a little. Do not try to shift it up too far as the frequency limit of the XR2209 is specified as 1 MHz, although you might get it to operate a little higher than that.

In the receiver described, the IF channel was specifically designed with a narrow bandwidth and a steep out of band slope so that 10 kHz could be tuned. If an attached receiver option is used, tuning quite as low as 10 kHz might be restricted if the receiver bandwidth happens to be too wide.

Considering some other options, a different type of RF amplifier could easily be used, perhaps with better performance at the MF end of the tuning range. It is strongly recommended that you stay

with the XR2208 as a mixer, because of its balanced mixing type of performance and its low order of intermodulation products.

Summary

A receiver has been presented which tunes the VLF and LF bands and part of the MF band. The receiver makes use of a number of integrated circuit packages and circuit techniques, perhaps a little unusual in radio receivers. Use of the XR2209 oscillator package with resistance tuning and a broadband RF front end eliminates the need for a ganged tuning capacitor. The XR2208 operational multiplier performs as a mixer at the frequencies concerned with outstanding performance. The dual operational amplifier package LF353 has been put to

work as an RF and IF amplifier. A section of an inexpensive ceramic filter is used as crystal control for a stable BFO. There are no coils to wind as all the inductors are inexpensive RF chokes of preferred value, available off the electronics store shelf.

The receiver has more than adequate sensitivity on the VLF and LF bands. Its sensitivity falls on the MF band as 500 kHz is approached.

Included in the discussion is an introduction to what can be heard on the VLF, LF and lower MF bands. Apart from the complete receiver in itself, a few alternative options have been presented on how a VLF-LF front end could be added to an existing receiver. For the keen experimenting listener, the VLF-LF bands might well be another new field of endeavour to explore. **ar**

KENWOOD

CHRISTMAS SPECIALS

THESE OFFERS START
1ST NOVEMBER, 1989
AND CONTINUE UNTIL
STOCKS LAST. STOCKS
ARE LIMITED.

1 Buy a TS-440S or TS-680S and get a TH-45A handheld free. Worth over \$500



TS-440S

- 160m to 10m amateur band transceiver with 100kHz to 30MHz general coverage receiver • all mode operation
- automatic antenna tuner built in (80-10 meters)
- 200w PEP input



TS-680S

- 160m to 6m amateur band transceiver with 500kHz to 30MHz general coverage receiver • all mode operation
- optional automatic antenna tuner • up to 100 watt output

FREE one TH-45A
with your purchase of
either TS-440S or
TS-680S.

- 70cm FM handheld transceiver
- 5 watt output power
- multiple scan functions
- 14 channel memory



2 Huge saving on
the topselling
TH-25A

- 2m FM handheld transceiver
- 5 watt RF output
- memory scan and band scan
- 14 multi-function memory channels with lithium battery backup



Phone your Kenwood dealer
for price, or phone Kenwood
for the name of your nearest
authorised dealer.

KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.
(INCORPORATED IN N.S.W.)

4E Woodcock Place, Lane Cove, N.S.W. 2066, Australia
Ph. (02) 428 4222, (02) 428 1455, Fax (02) 427 6869
Call now for further information and the name of your nearest
authorised Kenwood dealer.

Please phone, mail or fax for information	
Name	Postcode
Address	
Publication	Issue
Model	

Joseph Henry, the scientist who had pioneered the first successful electromagnets and propounded the laws for practical construction. Henry, in 1831, already had built and demonstrated an electromagnetic telegraph over a distance of one mile.

A partnership with Dr Gale resulted, which was barren until joined by a young university graduate and skilled technician named Vail. A fourth partner was the lawyer Francis O J Smith, a US Congressman whose lack of scruples matched Morse's vanity. The lure was Government funds for development of the telegraph, which pious patriotism decreed would come from American know-how. Smith proved ruthlessly adept at lobbying.

Alfred Lewis Vail was the technical genius who devised the practical solutions. Naively he let himself become bound by contract with Morse to fashion new designs and obtain patents at his own expense in return for a share of the partnership profits. His father and brother assisted, for innovative tinkering was a family trait - an equally gifted cousin Theodore Vail Long was associated with the American telephone system from 1878 to 1919.

All that Alfred Vail invented and pioneered became a contribution to the common partnership without individual recognition, and was patented in Morse's name. Under Vail's inspiration the awkward numbered dictionary was discarded for a time-interval code of long and short impulses. In this Vail claimed no originality - in fact a similar code of dots-and-dashes first was used by another American in 1826. That was Harrison Dyar, who at the racecourse on Long Island demonstrated a system using high-tension discharge with blue litmus paper developing red streaks from fixation of the air's nitrogen to anhydride by the action of the spark.

No doubt exists that Vail alone, without Morse, devised the forerunner of our present telegraphic code, as well as the key to transmit it. This authenticated by contemporary references, including the "New York Sun" newspaper. And Frederick Read, the writer of Morse's biography, acknowledged that Vail "...furnished the means to give the child a decent dress". But that restrictive partnership covenant denied any acclaim for Vail.

Apocryphal fancy attributes construction of Vail's code to the layout of a printer's type font, which favours the letters most used. Thus it is said that E became a single dot, with the vowel I being two dots, and so on. Maybe so and maybe no, for beforehand the original swinging needle of Cooke and Wheatstone

Under the Special Patronage of Her Majesty

And H. R. H.  Prince Albert

CALVANIC AND MAGNETO ELECTRIC TELEGRAPH, GT. WESTERN RAILWAY.

The Public are respectfully informed that this interesting & most extraordinary Apparatus, by which upwards of 50 SIGNALS can be transmitted to a Distance of 280,000 MILES in ONE MINUTE,

**May be seen in operation, daily, (Sundays excepted,) from 9 till 6, at the
Telegraph Office, Paddington,
AND TELEGRAPH COTTAGE, SLOUGH.**

ADMISSION 1s.

"This Exhibition is well worthy a visit from all who love to see the wonders of science."—MORNING POST.

Despatches instantaneously sent to and from with the most confiding secrecy. Post Horses and Conveyances of every description may be ordered by the ELECTRIC TELEGRAPH, to be in readiness on the arrival of a Train, at either Paddington or Slough Station.

The Terms for sending a Despatch, ordering Post Horses, &c., only One Shilling.

N.B. Messengers in constant attendance, so that communications received by Telegraph, would be forwarded, if required, to any part of London, Windsor, Eton, &c.

THOMAS HOME, *Licencee.*

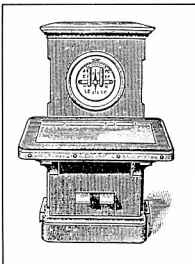
G. NURTON, Printer, 45, Church Street, Portman Market,

1 English railway poster of 1840

flicked once to the left for the letter E (sounding "click"), twice to the left for I ("click-click") and left-right for A ("click-clack") and so forth. The same combinations were used originally by Schilling, and later by Steinheil as well as Gauss and Weber.

However, this code of Vail shows scant resemblance to the form now used, for his dashes were of three varying lengths and the cyphers for the letters C, O, R, Y and Z had staggered spaces. The numerals he used also differ vastly from the version known today.

This mattered naught in a registering system, with the message decoded into plain language by sight. It was Vail who adapted the unwieldy receiving pantograph to a springwork-driven paper tape embossed with dots-and-dashed by a sharp stylus. Development proved protracted, and with the inexorable effluxion of time it was May 1844 before the first line was built over the 37-mile path from Washington to Baltimore. Interestingly, the conductors were of iron, for hard-drawn copper wire was unknown, and glass door-knobs formed the insulators.

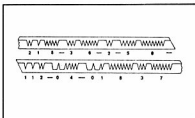


2 Single needle English telegraph

But again, as in England, the operators spurned the recording register and perversely preferred to resolve the clacking relay by ear instead. Thus was born the acoustic sounder, another of Vail's inventions. This variation proved vastly better - freed from mechanical restraints limiting receiving to ten words a minute, telegraphists began copying by ear at speeds of twenty and thirty words per minute, as fast as the fist could send.

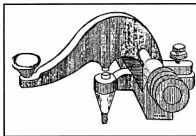
Then by 1846 true high-speed transmission by perforated tape was pioneered in England by Alexander Bain using his superior telegraphic code of even combinations. In his alphabet all the first half rationally commenced with a dot, the rest with a dash, and likewise the numerals.

But neither code suited European lan-

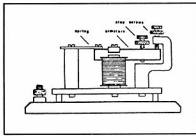


3 The system devised by Morse in 1837

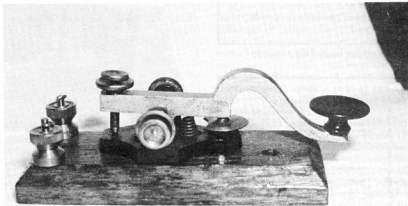
**Have you
advised DoTC of your
new address?**



4 Hunchback key of Alfred Vail c. 1840



5 The acoustic sounder's construction



6 Early American 'camelback' key - The Shawsmith Collection

guages, which abound in accented letters and other pronunciation marks called diacriticals. A conference of nations in 1851 combined elements of both to produce the revised Continental Code for use in Europe. Thus at one time varying codes were in use, but when radio this century adopted the 50-year old modified European version, it became the International Morse we know today.

Private companies in the US used individual preferences until a series of mergers began with the Mississippi Valley Printing Telegraph Company, leading to consolidation into Western Union by Hiram Sibley in 1856. And this nationwide company standardized on the original code of Vail. This then became styled Landline Morse, and was retained for line use in America until manual telegraphy became phased out in the present century.

Telegraphy eased its way into the days of Spark radio (first called "aerial telegraphy" and then "wireless"). The staccato tympany of the line sounder's "clickety-clack" became the rhythmic music of the earphone's "diddly-dah". Borrowing inspired abbreviations and the Q-series of the line telegraphists, radio honed use of morse into a sophisticated means of

global communications - a true universal lingo in its own right. Soundly complementing CW, the most efficient and economical of all modes, it cuts through QRN and QRM with the least bandwidth and the utmost intelligibility (the key has no accent). There is no incidence of error with competent exponents, and old timers sagely know the art as "the Immaculate Reception".

Being metrical in the classical sense of poetry, with related long and short iambic notes, it flows smoothly as any rollicking ballad. Yet, as modern as tomorrow, it forms a type of digital mode, each long and short equating easily to the 0 and 1 of binary notation. Thus even a dumb computer without a brain can read morse.

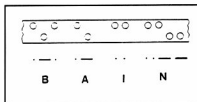
But that's only copy-book code of utter precision generated by another computer or punched tape. And only if signals are solid and in the clear without interference or fading. It's harrowing to watch a microprocessor balk and display garbage or a string of E's, while a human operator ignores trivialities, anticipating mangled bits to take correct hard copy, then signified by a cheery "RR - all received".

History thus is seen to repeat itself, for 150 years past it was known that no contrivance devised by man could match

the infallible ear of an expert operator.

Today's lateral schism regardless, it's still what distinguishes a fully competent radioman from those playing with inconsequential inanities as an idle pastime. It's also why examinations require proven proficiency in copying the code by ear.

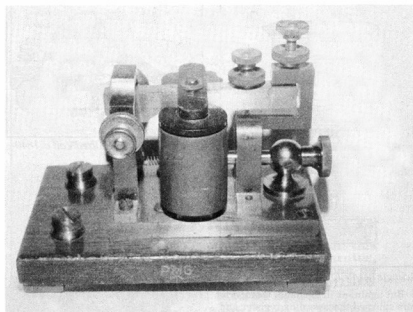
ar



8 The first perforated tape system

	BAIN UK	VAIL USA	CONTINENTAL Europe
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
1
2
3
4
5
6
7
8
9
0

9 How our present code was formed



7 Early bench mounted sounder - The Shawsmith Collection

WANTED DYED-IN-THE-WOOL ELECTRONICS/RADIO ENTHUSIAST!

Is this you? Read on!

We're looking for someone who is self-motivated and enthusiastic. We provide on-the-job training and will allow a half day off per week for you to pursue a relevant qualification. You'll be working with state of the art technology as a key member of a small, dynamic team. The position offers good opportunities for advancement.

Vital Communications Pty Ltd, who design and manufacture personal medical alert systems under the name of Vitalcall, are seeking a young, enthusiastic person who has an abiding interest in electronics and/or radio technology.

Established in 1976, Vitalcall is the market leader in this field, dedicated to performance and service. The company has offices in five states and exports to New Zealand, Pacific countries and the United States.

Formal qualifications? Not essential. Age? 17-20ish. Other qualifications? Enthusiasm, dedication, motivation.

Write or call:

Phil Wait, Technical Director
Vital Communications Pty Ltd
329 Pacific Highway
ARTARMON NSW 2064

Ph: (02) 438 3311 Fax: (02) 438 3249

**This space could be
earning you money!**

**Advertising rates
available from**

**PO Box 300
Caulfield South
3162 Vic**

VALVE RECEIVER CONVERSIONS

ROB GURR VK5RG
PO Box 35 DAW PARK 5041

Introduction

Over many years of Amateur Radio experimenting, I have frequently undertaken the modification of High Frequency communications receivers, to improve their effectiveness for amateur use. The available of World War 2 disposal items, and some other commercial manufacturers' receivers over the years, has been a source for such projects.

Equipment suited to conversion may be obtained by a number of methods, but my own manner has been to purchase cheaply, in "dubious" condition, at ham auctions, buy and sell meetings, and by direct barter. The most important thing is, not to buy too much of a "pup", as you could finish up with a worthless piece of junk. From experience, any receiver that has had its front-end coils or gangs altered in any way will never be restorable to its original tuning range.

If a receiver with an untouched front-end does come to hand, the most important initial work is to test it out and restore the front end to its original condition, be it valve or solid state. If the front end cannot be brought up to its original tracking and oscillator stability, it is difficult to proceed further. An ideal way to check out the front-end is to ignore those stages after the first mixer, and using an auxiliary IF/AF strip, work exclusively on the front-end.

I have rebuilt, modified and almost

ruined for all time, models such as BC348, BC342, MN26C, Command, SX28, RAX and many others. It is ideal that the front-end of each project is returned to the manufactured condition and specifications, to ensure no obscure faults are carried over into your conversion.

Solid State

It is ideal, of course, to totally convert the equipment to solid state. However, there may at times be reasons why some stages much be left in the original condition...such hybrid conversions might be necessary where decisions on further steps have not yet been made. Anyone in doubt about their first solid state conversion should consider my first attack on a Command receiver...prior to conversion, it consumed 11.3 Watts of low tension power and 12.5 Watts of high tension (total 23.8 Watts). On completion, the total DC consumption was 12 Volts at 250 milliamps (3 Watts), about a sixth of the original consumption...additionally it was a cooler set, weighed less, and I could work on it with greater safety due to the lower voltage.

There are now many alternative devices available, such as bipolar, FET, MOSFET, balanced mixers and other ICs etc.

Command Receiver

My latest conversion has been a 3-6 MHz Command, wherein I used a slightly different IF (1650 kHz in lieu of 1415 kHz). This was due to my possessing some 1650 kHz SSB 8 pole Crystal Filters, some of which had been used in previous conversions. A great deal of time had been spent a year or two ago experimenting with the oscillator tracking for this new IF.

This recent conversion used MFE131, dual gate MOSFETs, in RF, Mixer, IF, and Product Detector stages. Audio was from an MC1464 IC, AVC was generated in a BC108; the BFO a crystal controlled MPF102 "grid-plate" oscillator. AM detection was by a diode and dedicated MPF102 AF preamp, and USB/LSB switching by silicon diodes.

The tuneable oscillator however gave me a bit of a problem.

High Frequency Oscillator

Most of my previous oscillator conversions of Commands have used a circuit from "Shortwave Magazine", (fig 1) reprinted in "Amateur Radio", June 1968.

Continued on page 26

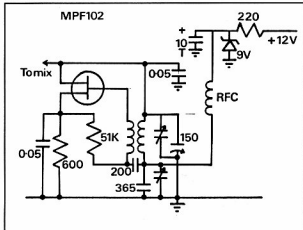


Figure 1

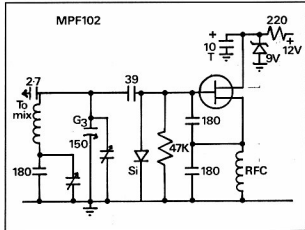


Figure 3

THE BEST YOU CAN GET!

Ultra Compact - Rugged Construction - Superb Performance! **The Yaesu FT-23R 2M Transceiver**

Superb performance on the 2m band with all the reliability you know you can expect from Yaesu. The FT-23R is tiny in size, only 55mm x 32mm x 139mm, yet this hand held packs more punch than you'd believe possible.

It's fully micro-processor controlled with 10 memories (7 memories can even be programmed for non-standard repeater shifts), repeater splits, pushbutton or manual scanning (busy/memory/priority), 1MHz up/down stepping, up to 5 watts output (with FNB-11) and more.

You get full 144 to 148MHz band coverage in the palm of your hand. Supplied with high capacity, 600mAh FNB-10 NiCad battery giving 2.5W output, AC charger, mini rubber-duckie antenna and carry case.

Cat D-3490

WITH FULL 2 YEAR WARRANTY

SAVE \$30

Now Only \$399



It's NEW
2m & 70cm In One!

The Amazing FT-470

Dual band performance at its best! The highly sophisticated FT-470 transceiver has just arrived. It represents the pinnacle of high-tech design in compact hand helds providing both 2m and 70cm coverage in one.

2.3 watts on the 2m and 70cm bands with the latest multi-tasking microprocessor control allowing a high degree of flexibility. In fact, several functions can be performed simultaneously - even the reception of 'both' bands at the same time! That's right, you can be talking through your local 2m repeater and scanning channels for your next 70cm contact at the same time.

There are also 21 freely tuneable memories and 2 VFO's per band. Plus inbuilt C.T.C.S.S. (Tone Squelch) with paging facility, a variety of scanning facilities, LCD display showing 5.5 frequency digits on both bands at the same time and LCD bargraph signal/P.O. meter. The programmable 'power saver' system helps maximize battery life, and frequency selection via tuning knob or direct keyboard entry is a standard feature.

Comes complete with high capacity 1000mAh NiCad battery pack, carry case, dual band antenna and charger. Why buy 2 hand-helds when you can have everything in one?

Cat D-3360

See A.R.A. review Vol 12, Issue 5

Just \$849
SAVE \$39.95

2 YEAR WARRANTY



YAESU

Computer Aided All Mode Transceiver! FT-747GX Budget HF Transceiver



Better performance and value for your dollar is the hallmark of the FT-747GX from Yaesu. Incredibly lightweight and measuring just 238 x 93 x 238mm it takes up next to no space in the shack and is well worthy of consideration as a mobile rig.

The FT-747GX SSB/CW/AM (& optional FM) transceiver provides 100 watts PEP output on all 1.8 - 30MHz amateur bands and general coverage reception continuously from 100kHz to 30MHz.

Superb Features

You get the ultimate in convenience including front mounted speaker, a clear unobstructed display and control layout that leaves selection, via the 15 pushbutton controls and two dual pots, as easy and uncomplicated as it can be.

With operator selectable tuning steps for each mode, dual VFO's for split frequency operation and 20 memory channels - eighteen of which can store split Tx/Rx frequencies. Wideband 6kHz AM, and narrow 500Hz CW IF filters are fitted as a standard feature, as well as a clarifier, switchable 20dB receiver attenuator and noise blanker to optimize reception under varying conditions.

It's also fitted with the CAT (Computer Aided Transceiver) system for user programming for even more advanced control by an external computer.

What's more, you'll get a BONUS D-2110 hand held microphone when you purchase your new Yaesu FT-747GX from Dick Smith Electronics, your authorised Yaesu Distributors.

Cat D-2930

SAVE \$90 \$1179

With 2 Year Warranty.

*Yes, we stock a range of antennas and mounting bases for mobile use.
Ask at your nearest store!*

DS XPRESS

PHONE AND MAILORDER SERVICE

ORDER BY PHONE - 008 22 6610 (LOCAL CALL FEE)
OUTSIDE SYDNEY SYDNEY AND ENQUIRIES - 888 2105

FAX (02) 805 1966 OR Write To DS XPRESS, PO Box 321 North Ryde NSW 2113

All major credit cards accepted, O/Nite courier available.

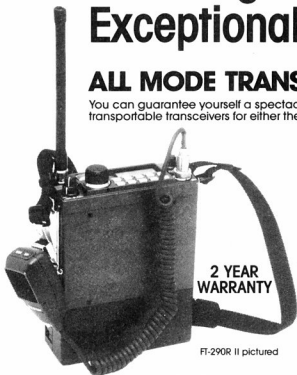
24 HOUR DESPATCH OF ALL ORDERS



Extra-High Performance- Exceptional Quality & Value!

ALL MODE TRANSPORTABLE TRANSCEIVERS

You can guarantee yourself a spectacular summer season with these all mode, multi-purpose transportable transceivers for either the 6M or 2M bands!



FT-290R II pictured

Either Version \$799^{ea}
Comes With Battery Holder (D-2876)
This month only! Save \$49.95

With 10 memories which store mode and repeater offset, 2 independent VFO's (set one on DX segment and the other on FM segment), all mode squelch, noise blanker on SSB/CW, 4 tuning steps per mode, 2.5 watt output power (plus selectable 250mW), analogue S-meter and PO meter, and full functions for operation through repeaters.

It's easy to operate with just three knobs and 10 buttons which allow access to all functions quickly and easily. The units are supplied with hand microphone and antenna. PLUS - they now come complete with FBA-8 (9 x 'C' size) battery holder for shoulder-carried portable operation at no extra charge!

6 Metre - FT-690RII

Covers 50-54MHz. Channels steps SSB/CW - 25/100/2500Hz.

With telescopic whip antenna.

Cat D-2874

2 Metre - FT-290RII

Covers 144-148MHz and comes with rubber duck antenna.

Cat D-2875

See A.R.A. review Vol 12, Issue 5.

ONE PLACE TO SHOP FOR ALL YOUR ACCESSORIES!

High Quality 2-Way Coax

You can tell by the way it feels that this ultra high quality 2 position coax switch will give you years of trouble free operation. Suitable for HF, VHF and UHF (900MHz) use. Gives superb isolation, lower insertion loss (<0.1dB) and better performance. Anything less just isn't worth it!
Cat D-5208
Nothing But The Best!



\$69⁹⁵

15 Watt Finned Dummy Load

A high quality coax terminator with superb SWR characteristics. Heat resisting ceramic resistor assures <1.2:1 SWR DC - 500MHz, with gold plated core for minimum contact resistance. 50 ohms impedance at 15 watts continuous or 100 watts up to 30 seconds.
Cat D-7025



\$39

Rak BL-50A Balun

Designed for use as a centre support for dipoles or yagi antenna. Input is 52 Ohms balanced with output 52 ohms unbalanced. The RF input power is 1kW with an insertion loss of less than 1dB. Frequency range covers the entire HF band (3 to 30MHz).
Cat D-5310



\$59⁹⁵

Problems With TVI & BCI? Shinwa Filter

Great for amateur use! Easy to fit and helps eliminate TVI and BCI. Handles up to 500 watts. Cut off is around 30MHz with an insertion loss of less than 1dB and maximum attenuation of around 50dB. An easy solution!
Cat D-7080



\$39⁹⁵

**DICK SMITH
ELECTRONICS**



The Ultimate 2 Metre Hand-held Transceiver



The FT-411 is a top-of-the-line ultra compact 2 metre handheld offering an incredible array of features without the size and weight of previous sets. Expanding on the microprocessor controlled features of previous models, the front panel multi-function back-lit keypad allows easy frequency entry, selection of the 49 tunable memories (which store repeater shifts, or separate Tx/Rx frequencies), setting of the programmable-interval 'power-saver' system, as well as a host of other convenience features. CPU control also offers 2 VFO's, rotary dial tuning with 5 selectable tuning steps, a multi-function back-lit 6 digit LCD screen with bargraph Signal/P.O. meter, and a range of scanning options. Even VOX (voice-activated transmit) circuitry is provided, allowing hands-free operation with the optional YH-2 headset.

Yaesu have also recognised that a hand-held radio must be ruggedly constructed, and yet be small enough and light enough to carry around all day. Through the extensive use of surface-mounted components, a heavy duty die-cast rear panel, rubber gasket seals around all external controls and connectors, and a carry case supplied as standard, the FT-411 will provide reliable operation even in dusty or humid environments while measuring only 55 (W) x 155 (H) x 32mm (D), and weighting less than 550 grams (including a high capacity 1000mAh FNB-14 NiCd battery giving 2.5W output). A range of inexpensive optional accessories are also available to provide flexibility for users differing requirements. See ARA review Vol 12 Issue 3.

Complete Package: FT-411, FNB-14 7.2V NiCd, Carry Case, Antenna, Approved AC Charger.

SAVE \$30 \$469

**EXCLUSIVE
2 YEAR WARRANTY**

Optional Accessories

D-3350

PA-6 DC Adaptor/Charger suit FNB9/10/14
FNB-11 600mAh NiCd Battery (5W output)
MH-12A2B Speaker/Microphone
YH-2 Mic/Earphone Headset

D-3498 \$39.95
D-3496 \$99.00
D-2115 \$49.95
D-2200 \$49.95

**DICK SMITH
ELECTRONICS**

• NSW • Albany 21 8390 • Bankstown Square 707 4888 • Blacktown 671 7722 • Campbelltown 046 07 2199
• Chateauwood Chase 411 1955 • Chullora 542 8522 • Green Hills 439 5311 • Gosford 25 0235 • Hornsby 477 6633
• Hurstville 580 9022 • Liverpool 650 9888 • Maitland 33 7865 • Miranda 525 2722 • Newcastle 61 1896
• North Ryde 88 3855 • Parramatta 699 2188 • Penrith 047 02 3400 • Railway Square 211 3777 • Sydney City
267 0111 • Townsville 66 5711 • Warrington Mall 305 0441 • Wollongong 25 3800 • ACT • Fyshwick 10 4944
• VIC • Ballarat 31 5433 • Bendigo 33 0388 • Box Hill 856 0659 • Casey 03 381 4455 • Dandenong 704 8277
• East Brighton 582 2366 • Essendon 379 7444 • Footscray 889 2055 • Frankston 760 9144 • Geelong 43 8804
• Melbourne City 326 6588 • Richmond 458 1614 • Ringwood 878 5333 • Rye 547 0625 • QLD
• Brisbane City 229 9277 • Buranda 351 8233 • Cairns 317 515 • Chermside 359 6255 • Redbank 288 5599
• Rockhampton 27 9644 • Seaford 30 9683 • Townsville 32 3200 • Toowoomba 32 5722 • Underwood
341 3844 • SA • Adelaide City 235 1200 • Beverley 347 1900 • Bl. Mary 277 8977 • Elizabeth 265 6090
• Eyreford 260 6588 • WA • Cannington 451 6650 • Fremantle 325 3723 • North Perth 328 8944 • Perth City
481 3251 • Midland 255 1460 • YAB • Hobart 31 0800 • NT • Stuart Park 91 1077

*Yaesu stock not available at all stores; please call for availability

From page 21

In this circuit the MPF102 FET is directly in place of the triode valve, and coupled to a suitable DC supply. All worked well - however one particular fault showed up in this recent conversion.

With the set working well, and quite equal to other receivers in the shack, I utilised it as a tuneable IF for some 2B,52 and 144 MHz converters. I was shocked at the number of "joey's" or "beats" I could hear across the various bands, and checked to ensure they were not produced by the line oscillator of any nearby TV receiver. During these tests, I found my 147 MHz FM receiver mute opened up for no apparent reason...eventually, I determined that the tuneable oscillator had a lot of high level harmonics radiating from it.

I calculated a few of them, and they were way beyond the 40th, and were very strong on 147 MHz etc...no wonder spurious signals showed up on the converter set up.

Previous use of the converted receivers for straight tuning of their design ranges had not shown these harmonics to be any problem. The oscillator in use in the set was of the "tickler" feedback type, but used the tuned circuit as the anode load and the feedback winding in the grid circuit.

Development Of A Circuit

I was aware from previous experience that there were two alternative circuits I should try...the Franklin or the Colpitts. The Franklin required two transistors or FETs plus an isolating stage, all of which were too big for the available space. The Colpitts used only one device, and most of the mounting points were already in-situ (point to point wiring was used throughout the conversion), so I decided to save the Franklin idea until after the Colpitts had been assessed.

The oscillator tuning range required for the set was 4.65 MHz to 7.65 MHz. However, the shunting effect of the high capacity feedback divider network, as well as the heavy coupling capacitor in the ideal circuit (fig 2), made the achievement of this range impossible...I had lost the required tuning range, but had by

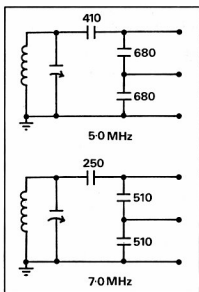


Figure 2

now proved the harmonic output of the Colpitts was totally acceptable.

Experiments at reducing the coupling capacitor showed that there was a lower limit where oscillation failed; similarly, the feedback capacitors also could be reduced, but only to a lower limit at which the same effect occurred. As the values were reduced, the tuning range became more realistic. Finally, with the values shown (fig 3), I had a stable oscillator, suitable tuning range, and the objectionable harmonic radiation. I was additionally delighted that, when checking against my 500 kHz crystal marker, the calibration at all seven 500 kHz calibration marks on the 3 to 6 MHz dial were spot-on. The use of the feedback winding in the old Command oscillator coil was now unnecessary.

Summary

The above oscillator experience is recorded for the information of others undertaking similar conversions of high frequency receivers. Whilst an article on the overall conversion is unlikely, I have a copy available of the final receiver circuit, to assist anyone with a similar bent. Correspondence on such conversion techniques would be welcomed. **ar**

VHF Communications Magazine

Some back issues available at the following prices:

1970 - 1984

\$5.50

including post

1985 - 1989

\$7.75

including post

Binders

Available for
\$9.00 each
including post

VHF Comms
PO Box 300
South Caulfield
3162
Victoria

When you buy something from one of our advertisers, tell them you read about it in the WIA Amateur Radio magazine.

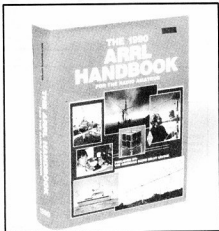
The Ideal Christmas Gift ... The New ARRL Handbook For 1990 Is Now In Stock ... so order now to be sure of your copy ...

This is the most comprehensive edition since the **Handbook** was first published in 1926. The sixty-seventh edition contains over 1200 pages and over 2100 tables, figures and charts. Added to this edition are new antenna projects including three high-performance Yagis for 144, 220 and 432 MHz designed by Steve Powlishe, K1FO. Dick Jansson, WD4FAB, has completely revised the space communications chapter, which includes his innovative helical array for AO-13 Mode L.

As always, the **Handbook** includes many chapters of construction projects, including:

- Power supplies, keyers and measuring devices
- QRP transmitters and VHF/UHF preamps
- High-performance communications receiver
- High-power HF and VHF amplifiers
- 1296-MHz transverter
- Digital audio memory keyer

The **HANDBOOK** has always been known as a reference for component data. There is an entire chapter devoted to everything from tube and transistor specifications to aluminium tubing sizes. There also is up-to-date information on digital techniques and operating practices.



1990 ARRL Hand Book (Hard Cover) Stock Number WIA 287 \$52.90 .. Less 10% For WIA Members

The New 1990 Call Books

Extending a 69 year tradition, we bring you three new Callbooks for 1990, bigger and better than ever! **The North American Callbook**, the **International Callbook** and the new **Callbook Supplement** bring you accurate up-to-date QSL information on over 1,000,000 amateurs throughout the world.

The North American Callbook lists the calls, names and address information for over 500,000 licensed Radio Amateurs in all countries of North America from Canada to Panama, including Greenland, Bermuda and the Caribbean islands plus Hawaii and the US possessions.

The International Callbook lists over 500,000 licensed amateurs in countries outside North America. Its coverage includes South America, Europe, Africa, Asia, Australia and the Pacific area (exclusive of Hawaii and the US possessions).

The 1990 Call Book Supplement is a new idea in callbook updates, listing the activity in both the North American and the International Callbooks. It will be published on the 1st June, 1990, this combined supplement will include thousands of new licenses, address changes and call sign changes for the preceding 6 months.

Every active amateur needs the **Callbook**!

The 1990 Callbooks will be published on December 1, 1989 and we should have stocks in Australia by Air Freight by the 2nd week of December so please order your copy now and have it in time for Christmas.

- Over 1,000,000 current amateur listings in all countries of the world
- Telegraph Codes ■ Then and now call changes ■ Silent Keys
- Census of Amateur Licenses in all countries ■ Standard Time Charts
- International Postal Information ■ World-wide QSL Bureaus
- Table of Amateur Prefix Allocations ■ Prefixes of the world
- Plus many other features.

1990 Nth American Call Book Stock # WIA288 \$58.50 Less 10%

1990 International Call Book Stock # WIA289 \$62.50 Less 10%

1990 Call Book Supplement Stock # WIA290 \$17.50 Less 10%

Supplement Available June/July 1990

MAG PUBS

The above books, plus many more, are available from your WIA Divisional Bookshop.

All items are plus postage and handling where applicable if not in stock at your Divisional Bookshop, order will be taken and filled promptly

TR-7 OPERATION WITH VHF TRANSVERTERS

THIS IS A FACTORY MODIFICATION FROM THE RL DRAKE COMPANY.
IT HAS BEEN SUBMITTED TO AR BY W TOMCZYK VK2OE

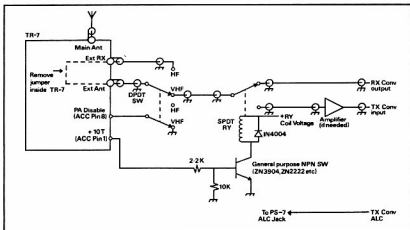


Figure 1 Using the TR-7 with a VHF Transverter

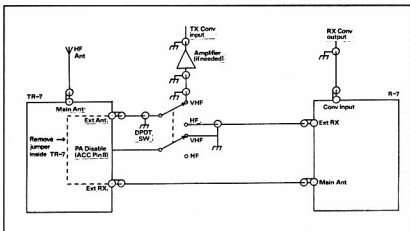


Figure 2 - Using the TR-7/R-7 Combination with a VHF Transverter

Operation of the TR-7 with devices such as transverters requires a low-level transmit drive signal. While it is possible to use an attenuator on the output of the TR-7 to obtain such a signal, there is another method which is more efficient and eliminates the chance of overdriving the accessory device.

Refer to figure 1, and note that that in the VHF position one section of the DPDT switch grounds the PA Disable line (pin 8 of the TR-7 Accessory connector). This prevents the relay and power amplifier section of the TR-7 from operating in transmit mode, and provides a low-level signal at the EXT ANT jack on the rear panel. This signal is routed through the other section of the DPDT switch to a relay which selects the receiving and transmitting converters as required. Note that since the TR-7 relay is not operational in this configuration, the HF antenna is automatically disconnected.

The amplitude of the low-level signal obtained in this manner is approximately one milliwatt, or 0.2 volts (rms) into 50 ohms. If a higher amplitude is required, the signal can be amplified by a one or two stage transistor gain block, many of which have been described in the literature.

The DPDT switch, relay, switching transistor and associated components can all be housed in a small enclosure to provide shielding and operational convenience. Note that all RF leads should use RG-58 or similar coaxial cable. In addition, be sure to remove the jumper between the EXT RX and EXT ANT jacks in the TR-7 for proper operation.

Figure 2 shows the interconnection method when using the TR7/R7 pair. In this case, the relay is eliminated, and the converter input of the R7 receiver is used for the receiving converter output. For transceive operation, depress the RCT pushbutton on the TR-7.

Operation of the TR-7 and R7 will be exactly as described in the Operator's Manuals for these units, except that the TR-7 relay and power amplifier will not function in the VHF mode. With the DPDT switch in the HF position, operation will be entirely normal.

ar

Repeaters - addition, deletions, alterations

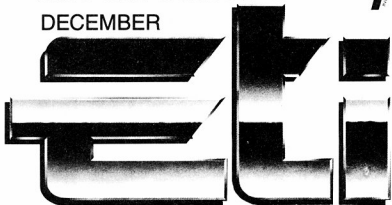
**Have you advised the
WIA Executive Office
of changes to the repeater list?**

OUT NOW

At all good newsagents and book stalls

Electronics Today

DECEMBER



ELECTRONICS • TECHNOLOGY
INNOVATION

FREE INSIDE: HUB

Australia's leading information technology
magazine

Power in remote areas

What to do when the grid's not handy

Fibre in the home

Domestic applications for optical fibres

PROJECTS TO BUILD:

- Quad Antenna
- Flash Converter
- PC In-Modem Pt 2

PLUS



Sound Ideas — Sound Advice — Sound Products
More information and 84 pages of colour!

CAN YOU AFFORD NOT TO READ IT!

BETTER TELEVISION AND RADIO RECEPTION

A true self-help guide written in plain language which communicates technical concepts in a readily understood manner for those needing to deal with interference and reception problems. Jim Linton VK3PC reviews this DOTC publication in his second feature article on the Department's plan to charge a \$60 fee before its field staff will visit a household to diagnose the cause of degraded TV or radio reception.

Better Television And Radio Reception Booklet

The Department of Transport and Communications (DOTC) has spared no effort in its new publication called "Better television and radio reception - your self-help guide." It is part of the Department's educational program aimed at consumers, electricity supply authorities, and the electronics repair industry. DOTC in the book explains that well over half of all reception problems are caused by deficiencies in receivers, inadequate or faulty antenna installations, or result from people trying to receive stations too distant for reliable reception.

In recent years there has been an increasing tendency for members of the public to call on the Department's field staff to check out every claimed interference problem. In nine out of ten such investigations, currently about 17,000 a year, it was found a reception problem existed and the problem was not the result of genuine interference. In these cases, the remedy could have been achieved by the householder or with help from a service technician.

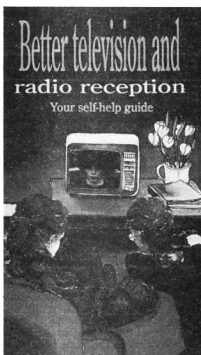
The book is truly a self-help guide, written in plain language, and DOTC hopes it will result in many reception problems being fixed without its involvement. It offers advice on how to choose and install the right type of antenna, a list of filters and associated devices, and how to select a television technician or antenna specialist. DOTC has held briefing seminars with industry groups, and those who attended were eager to get their hands on a copy of the book.

An information package including the book is being sent to radio and TV repair service organisations and antenna installers throughout Australia. There was a lack of experience in how to deal with immunity problems and the book will be a valuable reference guide. The DOTC education initiative is certain to see an increase in the number of reception problems being handled by the TV service industry itself. Electricity supply authorities have also been consulted on the need for them to respond, when complaints are made about degraded TV reception caused by power line faults.

The publication is in an ideal format with high quality photographs depicting typical reception and interference problems. The consumer or technician can easily find a reference and picture of a problem and advice on how to deal with it. There are sections on television and VCRs, AM radio, FM radio, and other electronic equipment. Each section is a step-by-step guide in diagnosing the particular reception or interference problem being experienced. It cannot be over emphasised in reviewing this book, that the language it uses communicates technical concepts in a readily understood manner. The first section makes reference to radiocommunications transmitter interference, and has pictures showing typical AM, SSB and FM transmitter interference to TV sets and Video Cassette Recorders.

It states: "In almost all cases, the cause is not the radio transmitters or its operator. The problem occurs because some television receivers are incapable of rejecting unwanted signals from nearby transmitters. This deficiency is termed lack of radio frequency immunity." It then details the cures for this type of problem including the use of simple plug-in filters.

In a similar manner, it informs readers that a number of other appliances such as hi-fi systems, cassette recorders, telephones, electronic organs and home intercoms can be affected by a nearby transmitter. The book says these devices are designed to reproduce audio frequencies only, and should not be able to pick up Citizens Band, Amateur or business two-way radio transmitters. The meth-



ods by which the radio frequencies are reproduced in this audio equipment are discussed with suggested cures.

Powerline interference, electrical appliance interference, and interference caused by computers is explained along with remedial action. Typical interference patterns seen on TV screens caused by a fault on a nearby high voltage powerline are shown by photographs. The book says if neighbours experience the same problem, then this is usually a good indication that the cause is a powerline fault. After making sure all is in good order with a household TV antenna system, DOTC advises that the consumer contact their electric supply authority. And while the book is a self-help product, the Department doesn't intend to abandon consumers. It has set up a telephone advisory service for those who experience difficulty in using the book.

DOTC will continue to operate an interference investigation service provided to investigate interference to radiocommu-

nications services, as well as genuine interference involving broadcasting services. However, it has embarked on a program to educate consumers, power supply authorities and the TV service industry on their obligations regarding reception problems. DOTC field staff have been overloaded with calls to the Department's present free investigation service, with most of investigations turning out to be reception problems. Although 17,000 such calls are handled a year, these would only be a small fraction of those experiencing reception problems which can easily be cured.

DOTC aims through its education program to make the public aware of typical reception problems and how to fix them. The Department spends over one million dollars a year, with its highly skilled and equipped staff investigating claims of interference which turn out to be a receiving system problem, or a power line fault. It is seeking an improvement in this situation for both itself and TV viewers (radio listeners) by a two stage approach.

The first will include the release of the self-help guide which in summary explains how to achieve better reception and where to seek the best advice. The

book includes a questionnaire to help identify the likely cause of a reception problem, and what action should be taken to resolve it. This will be backed up by a telephone advice service available through a STD-free 008 phone number.

After the book is widely available and publicised in the media, DOTC will bring in the second stage of its program. In late 1990 or early 1991 it will introduce a \$60 fee for those who want DOTC field staff to visit their home to diagnose the cause of degraded TV or radio reception. The consumer also has the choice of not paying the fee and merely sending the Department a completed questionnaire, if they wish to report a specific source of interference.

In this circumstance, DOTC staff will not send its staff out to diagnose individual problems. The questionnaire will be used to monitor the nature and incidence of reception problems, and to detect cases of interference and broadcasting planning problems which affect the wider community.

Better Television and Radio Reception - your self-help guide, will be available free from DOTC in early December and copies should be held by most WIA divisions as a membership service. **ar**

QD **ELECTRONICS**

RADIO REPAIRS AND SERVICE

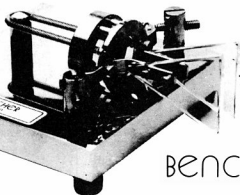
Tel: John Melia VK3QD

radio technician
engineering

(03) 751 1231

Lot 7 Ridge Rd.,
Cnr. Yvonne Rd
Mount Dandenong
VIC 3767

licensed second-hand dealer



the Ultimate 1AMBIC PADDLE

BENCHER, INC.

ADJUSTABLE CONTACT POINT SPACING — Precision screw adjustments on each set of contacts make exact settings easy. Contact posts are split and locked by set screws, eliminating locknut "drift"

WIDE RANGE OF TENSION ADJUSTMENT — Tension on finger knobs is maintained by a long expansion spring. Dual screw adjustments vary the spring tension to match your "list"

SELF ADJUSTING NEEDLE BEARINGS — Keying shafts pivot in nylon bearings that "float" on precision steel pins. Spring tension prevents free play and slop; eliminates contact bounce and backlash

GOLD PLATED SOLID SILVER CONTACT POINTS — The contact points are gold plated solid silver for a lifetime of flawless keying

POLISHED PADDLES — Lucite paddles are machine-polished for silky feel

PRECISION-MACHINED COMPONENTS — Main frame, contact posts, spring post and bearing ring are all machined from solid brass, chrome plated for durability

and rich appearance. The Bencher Paddle looks as good as it works!
HEAVY STEEL BASE, NON-SKID FEET — Standard model has attractive black textured finish; deluxe model is chrome plated. Base measures 9.5cm x 10.2cm x 1.6cm thick. Unit weighs 1.36 kilograms, and with its non-skid rubber feet is as solid as a rock

Stock # MM001 **BY-1 Iambic Paddle — Black Base \$132**

Stock # MM002 **BY-2 Iambic Paddle — Chrome Base \$162**

All Prices Amateur Net Tax Included PLUS \$10.00 pack & post

Mail Orders Welcome
Bank Card, Master Card or Visa



STEWART ELECTRONIC COMPONENTS Pty. Ltd.
44 Stafford St., Huntingdale 3166 Victoria
Phone (03) 543 3733 FAX (03) 543 7238
Post Office Box, 281 Oakleigh Vic.3166

THE GEORGE BUSH, MA MIKHAIL GORBACHE

What has made Icom's range of transceivers world leaders in their class? Could it be the uncompromising standards of a George Bush? Is it the durability of a Maggie (Iron Lady) Thatcher? Or the innovative thinking of a Mikhail Gorbachev?

It is, in fact, a combination of all three.

Which has led millions of radio users around the world to choose Icom. Their vote has made Icom the world leader of transceivers.



Announcing the IC-726. An advanced, HF/50MHz transceiver that combines VHF technology with the latest in sophistication. Designed for amateurs or veterans, and ideal for mobile users. 26 programmable memory channels, multi-mode transmitting and receiving and a host of other features and options.



The Icom IC-765 HF transceiver features DDS synthesiser, high speed auto tuner, built-in AC power supply, 99 programmable memories, keyboard frequency entry, band stacking register, general coverage receiver 100KHz-30MHz, C1-V system for PC control and rack mounting dimensions.



The Icom IC-32AT dual band FM transceiver outputs 5.5W and has a full duplex crossband operation, on/off switchable power saver and 20 double-spaced memory channels that can store two frequencies. The programmed scan function scans all frequencies between two programmable frequencies. And Priority Watch monitors the Call Channel, a memory channel or all the memory channels in succession, every five seconds.



The Icom IC-228A (25W) and IC-228H (45W) mobile FM 144MHz transceivers are compact and easy to operate with 20 memory channels, multi-colour LCD programmed and memory scans, variable tuning steps, priority watch, main controls lit for night operation.

RGARET THATCHER AND V OF TRANSCEIVERS.



The Icom IC-475A (25W) and IC-475H (75W) 430 MHz All Mode transceivers are designed for packet mode with direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, passband tuning and adjustable IF notch filter.



The Icom IC-575A (10W) and IC-575H (100W) 28/50 MHz All Mode transceivers have a receiver coverage of 26-56 MHz and are equipped with direct digital synthesizer (DDS), 99 memory channels, and passband tuning.

The ICOM IC-4SA an amazing 70cm midget hand held. Comprising 48 memories plus 1 call channel, operating from batteries with 5 watts output at 13.8v

or an external 12v DC supply. Auto power off function, scanning, scan skip, clock and time function, an optional pager and more.



The Icom IC-275A (25W) and IC-275H (100W) All Mode 144MHz transceivers are designed for packet mode and feature direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, and passband tuning.



The remarkable IC-2SAT is the ultimate in mini handheld high performance 2M FM transceivers. With convenient keyboard, rechargeable batteries, 5W output (opt. with a 13.2v battery pack), 48 memories, a call channel and a variety of other sophisticated super multi functions. Plus 18 optional extras. Another marvellous breakthrough in miniaturized hand holds.

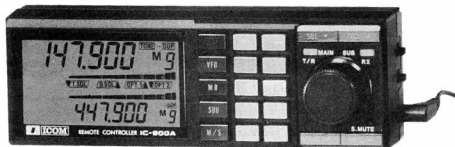
Call Melbourne on (03) 529 7582 or interstate on (008) 338 915 **ICOM** for your nearest Icom stockist.

WIA 80 COMPETITION!

CELEBRATE THE 80TH ANNIVERSARY OF THE FIRST AND OLDEST NATIONAL RADIO SOCIETY IN THE WORLD

WIN

AN ICOM IC-900A MULTI-BANDER SYSTEM VALUED AT \$2000



Remote Controller

How would you like to win a fantastic ICOM IC-900A series multi-band mobile control unit, complete with modules for two metres and 70 centimetres, plus your option of either six metres or 10 metres?

Thanks to ICOM Australia Pty Ltd, the winner of this competition will receive a magnificent IC-900A multi-bander system set up for 144 and 432 MHz operation, and will be able to select either the additional six-metre or 10-metre module.

However, you could still be a winner, even if you do not win this IC-900A. The three runners-up in this great competition will receive a full refund of their 1990 WIA membership fees, worth up to \$65.00 each.

Who can enter?

This great contest is open to any person who is a financial member of the WIA as at 1st February 1990, except that employees or office bearers of the WIA Divisions and Executive are not eligible to win a prize.

How to enter?

Easy! Fill in this form by completing, in less than 30 words, the statement "I am a member of the WIA because . . .", place it in an envelope together with your address label accompanying this issue of Amateur Radio magazine, and post it to "WIA 80 Competition, PO Box 300, Caulfield South, Vic. 3162", to reach us no later than 1st February 1990.

A photocopy of this form may be used if you do not want to cut up Amateur Radio magazine, but the Amateur Radio address label must be the label used to mail this issue of Amateur Radio magazine to you. This competition will be run over a period of three months, and WIA members can enter three times if they so desire.

The winning entries will be selected by a judging panel, and the winners will be announced in the March 1990 issue of Amateur Radio magazine.

WIA 80 Competition PO Box 300 Caulfield South Vic 3162

Dear Sirs,

I wish to enter the WIA 80 competition, and accept the rules as published.

I am a member of the WIA because

.....

(Complete this statement in 30 words or less)

Callsign or Membership Number Signed

JARL HAM FAIR

DAVID WARDLAW VK3ADW

While in Tokyo to attend a Region Three Association Directors meeting I visited the JARL's HAM FAIR, held at the New Hall of the International Trade Center in Harumi, Tokyo. This fair is supported by JAIA, the association of manufacturers of amateur radio equipment in Japan. The major manufacturers well known in Australia, Kenwood, Yaesu and Icom had large displays to show off their latest equipment. In addition, many smaller manufacturers had their own stands displaying a large variety of accessories. As well as the manufacturers a number of retailers were also represented and seemed to be doing a roaring trade, as were the stall holders in the flea-market.

The JARL, IARU Region 3 Association, TIRNA (the organisation of overseas amateurs in Japan), JLRs (JA YLs) and many specialist groups were represented on their own individual booths.

A special station 8JIHAM was operated on multiple bands throughout the period of the Fair using the latest equipment. A number of Australian stations were contacted. A special feature was made of the new WARC bands 18 MHz and 24 MHz.

This Fair, spread over three days, is the largest in the world, with an approximate total attendance of 58,000. This puts it ahead of America's "DAYTON HAMVENTION" and West Germany's "HAM RADIO" held in Friedrichshafen in Germany.

One striking feature of this Fair is the large number of young people attending.



In Front of The Simulated Control Room in the JAS-16 Booth-L to R: BZ1CP, JA1AH, 9VIRH, VK3ADW, W1RU and ZL2AHJ.

Showing that Japan does not have the problem that we in Australia, together with a number of other countries, have of attracting young people into the fraternity.

There was a home brew contest, with a significant number of excellent entries showing that the art of home construction is not lost in the land of the World's major manufacturers of amateur radio equipment. There was also a chance for visitors to the fair to demonstrate their proficiency in soldering - this attracted a

continuous crowd. On another stand, you could test your CW contest ability against a computer.

A number of advanced techniques were displayed, including spread spectrum using TV line oscillators to synchronise the system. This was on a closed circuit, as the JA administration doesn't allow it over the air as yet.

All in all, it was an excellent show, indicating the strength of amateur radio in Japan.

ar

EXTENSIVE RANGE OF ELECTRONIC COMPONENTS FOR THE RADIO AMATEUR & HOBBYIST

DISPOSAL BARGAINS

• STEPPER MOTORS • DISPLAY TERMINAL/KEYBOARDS • SWITCHED MODE POWER SUPPLIES
• MUFFIN FANS • POWER TRANSFORMERS • COMPUTER GRADE ELECTROLYTICS • CIRCUIT BOARDS

IAN J TRUSCOTTS

**ELECTRONIC
WORLD**

FOR ALL YOUR COMPONENT
REQUIREMENTS

MAIL ORDERS WELCOME

Phone: (03) 723 3860
(03) 723 3094

30 LACEY STREET
CROYDON 3136

HOW'S DX

STEPHEN PALL VK2PS
PO Box 93 DURAL 2158

Instead of "How is DX?", this column should have the title "How was DX?" as there is at least six weeks time lag between the events happening and the news appearing in print. Most of the activities reported here took part in October, however here is the news, as it happened. (The lag due to magazine requirements can be as little as three weeks - Ed).

Bouvet Island

After years of waiting for some activity from this uninhabited rocky island in the most southern part of the Atlantic Ocean (QTH: 54 deg 25' South 3 deg East) we will have not one, but two DX groups, which will activate this very rare "DX country". We reported in November "AR" about the Norwegian Club Bouvet group, which will commence activities this Christmas. News is now to hand, that another group, the 3Y0B DXpedition, will land on the island early February 1990. A 30 man/person scientific and radio team under the leadership of Mike, W9SU will be on the island for 10-12 days. Among the usual bands and modes, they will operate also on RTTY, and Oscar 13 will be available for 24 hours each day during this operation, with special program written for the activation.

Angola D2

Finally, after many rumours of alleged amateur activity from this war-torn African country, it seems we now have legitimate operation. LU6ELF/D2 started operating on the 7th of October. Jorge is a Captain in the Argentinian Navy, in the medical section. He intends to be in Angola until March/April 1990, with the United Nations Military Force. He was heard on the LU-DX net around 1900 UTC on 21340 kHz. It appears that his radio equipment is not the most modern, and his antenna restricts him to 21 MHz. However, according to the news heard from Jim VK9NS, it is possible that he will be in the possession of a more up-to-date transceiver soon.

Fernando de Noronha

This is a group of islands off the Brazilian Coast in the Atlantic Ocean. Under the call-signs ZYØRF, ZYØRC, and ZYØRV there was activity from the 29th of September to the 3rd of October, by Andree, Jim, and Epy. QSL route: ZYØRF to PYØFF, ZYØRC and ZYØRV to PY7XC.

North Cook Islands: ZK1

Ron, ZL1AMO and Robert ZL4DO were active on the North Cook Islands with their respective call-signs ZK1CQ and ZK1RS. CW mode is the favoured by Ron, and he was heard on most of the traditional spots on HF. QSL to their home calls.

Rotuma: 3D2

All those who missed out on Bing's (VK2BHC) first activity on this island, now have the opportunity to work this new "DX country". Bing returned to Rotuma on the 15th of October, and will stay there for about 3 months. His Rotuma call is: 3D2XV. This time, he will concentrate on ten metres and six metres operation, SSB only. QSL strictly direct to his home call.

Chatham Island ZL7

"Dusty" ZL2VS, one of the several operators of the "222" net, will be active from this remote NZ island from the 15th of January to the 29th of January, 1990. He will work mainly CW, using the special Commonwealth Games prefix: ZM7VS - QSL to his home call.

South Shetland

HL5BDS was working from this island in the Antarctic Peninsula. He has a sked with JA3MNM on each Sunday at 1100 UTC on 14120 kHz. QSL to: HL1ASS.

Pacific Wanderings SM7PKK

When you read these lines, Mats, SM7PKK is already on his way to Western Samoa as 5WIHK. He started his tour in October in American Samoa as KH8/SM7PK. Then he goes to Tokelau with the OH1RY boys. Sometime in December/January he intends to visit Rotuma, then Tuvalu and later West Kiribati. He does not plan to go back to Sweden before the end of April, 1990. (See also AR p61 Sept '89 and p59 Oct '89 - Ed.)

Space Shuttle Atlantis

Space shuttle Atlantis carrying Jupiter

probe "Galileo" left the US Cape Canaveral space base on the 17th of October 1989. When checking the bands around 14292 kHz at 1200 UTC on the 19th of October, I discovered an interesting broadcast. Goddard Amateur Radio Club, under the call-sign WA3NAN was broadcasting direct from the Shuttle the early wake up call for the astronauts. One could hear the morning reveille followed by military music, playing the popular navy song "Anchors away". One could hear the talks and comments between the astronauts and space centre, and all this right in the middle of SSB QSOs. Incidentally, the station, which has NASA connections, said that it had the permission of the FCC (the US equivalent of our DOTC) to do this broadcast.

Interesting QSOs and QSL Information

BZ4RDX - Knee - 21205 kHz SSB QSL to: Box 1827 Nanjing PRC.

JY5FA - Nasr - 14250 kHz SSB QSL to: Box 243, Amman, Jordan.

XU1SS/DU1 - Seth - He says he is one of the original operators of XU1SS which was very active for a few months in 1984 from Kampuchea on 14165 kHz SSB. He gave his QSL information as: YB3CN.

JTØDX the Hungarian DXpedition from Ulan Bator, Mongolia. They were active on several bands, until the 15th of October. QSL to: HA6KNB.

D44BS - Angelo - 14220 kHz SSB. QSL to: Box 104 Praia, Cape Verde Republic Africa.

VQ9TC - George - Chagos Archipelago = 14010 kHz CW. QSL to: NØJCV.

ZR1RC - Roger - 21205 kHz Grand Cayman Island SSB. QSL to call-book address.

PP5ZYZ - Joe - Brazil - 28488 kHz SSB, Santa Catarina Island. QSL to home call.

6W2EX - Jacques in Senegal, 14243 kHz SSB. QSL to: F6FNU.

OY9JD John on Faroe Island, - 14 MHz. QSL to call-book address.

KNØE/P/KH3 - Pete - Johnston Island 28 MHz. QSL to: K9UIY.

YJ8AB - Jack in Vanuatu, - 21205 kHz SSB. QSL to: KC4MJ.

UZ12ZZA/Bob on Kildin Island near Murmansk - 21220 kHz. QSL to: UA1ZX.

CI1ASJ - Andy in Canada - 21296 kHz. QSL to: VE1ASJ.

V63CQ - Todd in Ponape - 28495 kHz SSB. QSL to: KB5FGL.

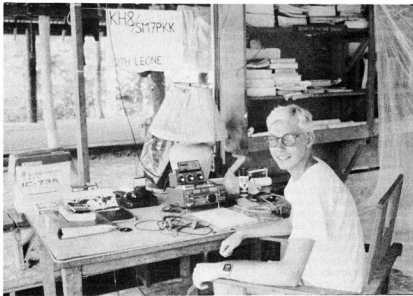
4U1ITU - Pierre in Geneva - 14220 kHz SSB. QSL to: F6HIZ.

3D2EA - Eric - in Fiji - 21205 kHz SSB. QSL to: Box 15377 Suva Fiji.

TJ1BW - Mike in Kumbo Cameroon - 21205 kHz SSB. QSL to: DL6FAL.

D44BC - Julio - 14194 kHz SSB. QSL to: Call-book address.

3D2VB - QSL to: OH3GZ



Mats Persson SM7PKK at his QTH in American Samoa during his 1988/89 tour.

JY5FY QSL to: Box 2121 Amman, Jordan.
 TI2KX QSL to: WA4JTK.
 HP2DS QSL to: Box 882 Colon Panama.
 ZF1DJ Box 1565 Grand Cayman Island
 West Indies.
 ZM5PX QSL to: ZL3PX.
 5W1KT QSL to: Box 1672 Apia Western
 Samoa.
 CE0ZIG QSL to: NR8J
 5N9NRK QSL to: Box 8426, Kaduna, Nige-
 ria, West Africa.

More About Nets

ANZA Net: It was Percy VK4CPA, who originated the net and gave the name ANZA to the net.

The "222" Net

It was in 1978 when I first discovered this net on 14220 kHz. It was called then if my memory serves me right - the Pacific Net, and was run by Jim P29JS. After Papua and New Guinea, Jim settled on Norfolk Island and he is now known world wide under the callsign: VK9NS. Jim organised and took part in many DXpeditions. One of the early ones was the Heard Island activity as VKØHI and VKØCW in January 1983. The latest was his expedition to Banaba (Ocean) Island under the callsign T33JS. The international amateur DX fraternity honored Jim in 1986 at the Dayton Convention, USA, when he was elected to the "DX Hall of Fame" organized by the well-

known "CQ" Magazine. The "222" Net - as it is known - operates on 14222 kHz each day (except Monday). Check-in starts at 0530 UTC. The net is run under Jim's guidance by a number of his helpers: "Dusty" ZL2VS, Frank VK1ZL, Heather VK2HD, Don VK1DH, Harry VK2BJL, Craig VK4SSB, John VK3WJ, and on the weekends, by Jim VK9NS himself. It is a world-wide DX net, and if you keep to the rules, you have an equal opportunity to work that elusive rare DX which appears only on Nets.

From Here And There And Everywhere

Mauri, OH4ML is on an interesting journey in the Pacific. He operated as OH4ML/H44 until the 18th of October, then moved on to 3D2ML, 5W1ML and as A35ML. He returns to Finland on the 7th of December.

Alex in San Jose, Costa Rica, operated under the callsign TI00D, celebrating 100 years of democracy in that middle American country. QSL to: TI4SU.

Martin, in Berlin (East), operated under the callsign Y40DDR celebrating the 40 years of existence of the German Democratic Republic. QSL to: Y28CO.

Malcolm, V85AH, is leaving Brunei soon. All QSLs to: RSGB QSL Bureau.

VLAD, 4KØF, is floating on Nordpol 30 (floating Iceflo). He reported his position on the 15th of October as: 83 deg North and 169 deg West and the temperature was minus 25 degrees! QSL to: UAØQBO.

There is no doubt, the Scandinavians like

the south Pacific. A Finnish group under the leadership of Peter, OH1RY has activated Vanuatu as YJØR, intends to go to Tokelau Islands, ZK3 in November, and might end up in Western Samoa and American Samoa. They will operate both in CW and SSB on the usual DX frequencies.

There were several Dutch stations operating with the special prefix of PA6Ø to PA66 celebrating the existence of 60 years of amateur operating licences in Holland. VKs have to work 15 special prefixes to qualify for a special award.

QSL Cards Received

Here is the latest list of cards received, which would identify the DX stations who really QSL. VKØMP, 3B8CF, 5Z4BI, EL2WK, EL2DK, GJØKKB, ZD8RP, FR5ZD, V31PC, VK9ZM, 5W1GY, TU2UI, KK1XV, VKØAE, J52US, TI8JL, YJ8JS, 8Q7MR, 3D2BW, VOTAW, VKØGC, T33JS, VK9ND, VR6ID, 9J2BO, FR4FD.

Finally, many thanks for the support received from: VK2RZ, VK3AJU, SM7PKK, OH1RY and "QRZ DX."

I wish you all a Merry Christmas and a healthy and happy New Year, and of course 73 and good DX-ing. **ar**

A Call to all Holders of a Novice Licence

Now you have joined the ranks of amateur radio, why not extend your activities?

The Wireless Institute of Australia (N.S.W. Division) conducts a Bridging Correspondence Course for the AOCIP and LAOCIP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion.

For further details write to:

The Course Supervisor
 WIA
 PO Box 1066
 Parramatta NSW 2124
 (109 Wigram Street, Parramatta)
 Phone: (02) 689 2417

**11am to 2pm Monday to Friday
 7 to 9pm Wednesday**

VHF - UHF

AN EXPANDING WORLD

ERIC JAMIESON VK5LP 9 WEST TERRACE MENINGIE 5264

All times are Universal Time Co-ordinated indicated as UTC

Beacons on Six Metres

Freq.	Call Sign	Location	Grid Square
50.000	GB3BUX	England	IO73
50.005	H44HIR	Honiara	Q100
50.006	ZS2SIX	South Africa	KE25
50.011	JA2IGY	Japan	PM84
50.015	SZ2DH	Greece	KM18
50.017	JA6ZIH	Japan	PM51
50.020	GB3SIX	England	IO73
50.020	CX1CCC	Uruguay	
50.025	6Y5RC	Jamaica	FK17
50.025	OH1VR	Finland	KP12 (1)
50.028	JA7ZMA	Japan	QM07
50.029	CT0WW	Portugal	IN61
50.032	ZD8VHF	Ascension Is	I122
50.032	ZS5SIX	South Africa	GQ50 (1)
50.035	ZB2VHF	Gibraltar	IM76
50.035	ZS3VHF	South Africa	JG87
50.039	FY7THF	French Guyana	GJ35
50.045	QX3VHF	Greenland	GP60
50.048	TG4BFX	Guatemala	
50.050	GB3NHQ	England	IO91
50.050	ZS6DN	South Africa	GQ44
50.056	VK9VF	Darwin	PH57
50.057	TF3SIX	Iceland	HP94
50.062	PY2AA	Brazil	GQ66
50.064	WD7Z	Arizona	EL59
50.065	GJ4HXJ	England	IN89
50.065	NB30/1	Rhode Is	FN41
50.066	VK6RPR	Perth	OF78
50.063	KH6HI	Hawaii	BL01
50.075	V8SIX	Hong Kong	OL72
50.078	T12NA	Costa Rica	ETK0
50.080	KH6JJK	Hawaii	BL11
50.080	HC8SIX	Galapagos Is	EL59
50.085	9H1SIX	Malta	JM75
50.086	VP2MO	Montserrat	FK86
50.088	V61SIX	Canada	FN55
50.090	KJ6BZ	Johnston Is.	AK56
50.092	W5GTP	Louisiana	
50.099	KP4EKG	USA	EM40
50.100	HC2FG	Puerto Rico	FK68
50.100	5H1HK	Ecuador	F107
50.100	6G6DX	Tanzania	
50.110	KQ6DX	Guam	QK23
50.110	A61XL	United Arab Emir.	LL74
50.120	4S7EA	Sri Lanka	MJ97
50.321	ZS5SIX	South Africa	GQ50
50.490	JG1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM54
52.100	ZK2SIX	Nive	AH50
52.200	VK8VF	Darwin	PH57
52.310	ZL3MHF	Christchurch	RE66

52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGV	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.435	VK3RMV	Hamilton	QF12
52.440	VK4RTL	Townsville	QH30
52.445	VK1KIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.460	VK6RPH	Perth	QF78
52.465	VK6RTW	Albany	QF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
52.510	ZL2MHF	Mount Clime	RE78

(1) These are two additions to the beacon list.

Although the beacons on 144 MHz and above are not due for listing this month, Peter Parker VK6BWI has written to say that the Busselton beacons on 144, 432 and 1296 MHz are off the air. According to the report the Busselton Radio Club is now defunct so the future of the beacons is in doubt until further notice.

Six Metres

I am still confined to a hospital room (now at Meningie Hospital) and will be for some further weeks. However, I am now able to spend some limited time at home in the company of my wife, although not during the hours when I might find some long haul DX on 50 MHz, hence, I continue to rely on the reports from other amateurs, in order that the record of activity is maintained. For those who have kindly enquired, I am making slow progress towards walking again; but a further six months of therapy may be required to arrive at a stage where I could be happy with my state of walking.

Peter, VK8ZLX sent me a copy of his log containing many mouth-watering contacts, and advised that his tally of countries worked stands at 45. Peter reported that 50 MHz was relatively quiet during September and early October, with the occasional JA being worked. The band started to open on 9/10, when at 1236 he worked VS6XCL and VS6XMQ followed by J11DXM. At 1253 V63AO was involved in a JA dogpile, and TV sound carriers were heard on 55.250 and 53.750. At 2147 the paging stations on 43.2 MHz were S9 plus. On 10/10 the JAs came through again from 1057, while YB2CTW and VS6XMQ and VK8ZLX

were involved with many JAs from 1318.

Then the big one came! On 11/10 at 0915 Peter VK8ZLX worked G4CCZ at 5x3, while Jeff VK8DF worked G2ADR at 0930. Peter said at first he thought someone was playing around when he worked G4CCZ, but when Paul gave his locator square as 1091 Peter knew it was authentic. At 0936 he worked G4FXW 5x4, 0941 G2ADR 5x3; 0945 G3ENZ 5x1. JAs were working H44GP, and police and pagers were on 42.120 and 43.200 respectively.

On 12/10 VK8ZLX scored another new country, when at 0843 LA3EQ in Norway was worked at 5x7. The saga continued at 0849 with G4CVI 5x2; 0850 EI6AS 5x5; 0853 PA0RDY 5x5; 0854 G3LQR 5x6; 0856 G3KOX 5x6; 0857 GW3LDH 5x5; 0859 G8ECI 5x7; 0900 GJ4ICD 5x4; 0901 G4ASR 5x3; 0903 JR5GFG 5x9; 0904 G4RFS 5x1; 0905 JA1PTK 5x9; 0906 DL8HCZ 5x9; 0909 G1AOPH 5x4. Between 0909 and 1017 Peter worked the following stations: G14TMB, G18YDZ, G3IMV, G4GIR, PA2VST, G3OIL, PA0HIP, PA0JOP, G8JDX, G4NDG, G0IMG, G3BJD, G3JVL, G4RQP, G3SEK, G1SDX, GW2HY, G0JHC, G8KRU, G4GAI, G1IYA, G0HNW, EI6AS, G3NEO, GW8ZCP, JH4PFU, GW3LDH, with signal levels varying from 5x1 to 5x9. His total was 44 contacts! Surely a red letter day for VK8 and possibly other VK call areas. Peter noted VK4DDG working a GU8 about 0940. On 12/10 Peter had to be content with JRB6U, JA3DXD and hearing the VS6SIX beacon.

It all started again on 13/10 when VK8KTM heard G4CCZ at 0755. At 0824 VK8ZLX worked OH2TI 5x5; 0826 PA2VST 5x1; 0833 PA0RDY; 0839 SM6PU 5x2; 0840 SM7AED 5x3; 0844 DL8HCZ 5x3; 0845 PA3ECU 5x3; 0849 PA6HIP 5x7; 0852 G3OIL 5x2; 0853 G3TED 5x1; 0856 G4CVI 5x9; 0857 G4ASR 5x5; 0903 PA0JOP 5x7. From this time until 1029 Peter worked the following: PA3BFM, PA2VST, PA0EHA, PA2HJS, JH7UPW, GJ4ICD, G3SED, G4BAO, G4JCC, G4CCZ, G3FXB, JH3ORQ, PA0HM, G3WOS, G8CUB, G0LFF, G4IJE, G4NDG, G6HKM, G6HB, G3HBR, G8ADM, PA3EGB, PA0BM, G3CEG, G2YEU, G4SJJ, G3ENZ, G8ECI, G1YDI, PA3ECU, G6HCY, GW3MHW, G1ZMS, PE1DTU, G3JVL, G3IBI, G4QKW. He also heard the GB3BUX beacon on 50.000 and the 5B4CY beacon on 50.499 MHz. At 1120 JAs were working 3D2 and P29.

On 14/10 the band opened earlier at 0614 to OH12AA 5x2; 0615 OH2HK 5x5; 0626 OH3MF 5x5; 0630 OH2BUW 5x2. Around 1730, the band seemed to fill with TV signals on 48.238, 48.250, 48.259, 49.758 all at S9. CW was heard on 50.104 at 0736 and there was a solar noise peak at 0751. TV signals continued on 48.260, 49.758 and 46.170 until at 0836 G3ZYY was worked at 5x5; 0837 G8JDX 5x1; 0853 G4CVI 5x5; 0905 F9DI 5x5; 0914 FC1JG 5x5 then back to more TV signals.

15/10 commenced even earlier at 0551 with OH2HK 5x5; OH22AA and OH2BUW heard;

at 0641 Jeff VK8GE worked OH3NJC at 5x5. At 0714 there was a strong video signal on 49.758 with considerable flutter, also on 48.238 at S8. The band opened to Europe again at 0717 with OH3NJC 5x5; from then until 1005, Peter worked OH5BM, OH1VR, JA1PVI, OH2II, OH9NLO, G8GXP, G4HBA, JH1QES, G3UKV, OH8MT, LA3EQ, LA12E, LA9BM, G3ZYV, JH5OJ3, LA9RAA. At 1115 Peter worked HL9TG, followed by JA dogpiles at S9 plus 80 dB! The JAs were also working to the Caribbean area via the long path.

On 16/10 there were many signals between 42 and 49 MHz from 0600 until at 0726 OH2TI was worked at 5x5. From then until 0950, Peter worked OH2KT, OH1YP, PA0HIP, PA2VST, GJ4ICD, PA3BFM, PA3ECU, PA0JOP, PA0FM, J1NFM, PE1ILY, JA1YDV, PE1DTU, J43BPN, OH1YP, PA6HHV, PE1HXX, G4CCD, SM7BAE, OH1AYQ and heard the OH1VR beacon on 50.025.

On 17/10 at 1335 VK8ZMB advised that Darwin stations were working to SV. On 18/10 JAs were working 9H1GB at 0924. JAs were into Alice Springs from 0936 and at 1316 Peter heard the SV1SIX beacon on 50.0395. From 1300 onwards 50 to 51 MHz was virtually ruined by massive video crud. The following morning at 2110 the pager signals on 43 and 44 MHz were S9 plus.

At 0830 on 19/10 VK8ZLX worked Steve VK3OT at 559 on forward scatter, and JA3XAI was 5x9 at 0934. On 20/10 it was V6XGCL at 1215 5x5 and JR6BU 5x5. On 21/10 at 0951 Peter reported very severe TEP distortion on 50 MHz. On 22/10 KG6DX was 5x9 at 0235, and at 0300 V63AO was 5x9 from the Eastern Caroline Islands.

Except for JAs, the band was relatively quiet until 27/10, when at 0850 Peter worked FC1JG at 5x1. At 0932 Peter worked G4KLF/MM, who was maritime mobile in the Gulf of Oman, and running 10 watts to a dipole antenna. The G4 station subsequently set up a cross-band contact between VK8ZLX on 50 MHz and OK3CM on 28 MHz. The Czechoslovakian station said it was unlikely that OK stations would be permitted any six metre privileges, due to the density of television stations in their country and those nearby.

At this point Peter's log ends; however, scattered through his log are comments that European stations were also being worked by VK8GF, at a rate almost consistent with his own, and by VK8KTM from time to time.

On 12/10 I received a phone call from Wally VK4DO at Airline Beach that at 0910 he had worked GJ4ICD at 5x9 and at 0916 PA0EHA at 5x7. The same day John VK4ZJB worked GJ4ICD at 0847 with signals 5x5. It is also known VK4BRG, VK4FFX and VK4DDG have been involved. Unfortunately, not being on the band myself, I cannot report who else may have had contacts.

It appears in general that the European stations have not been reaching very success-

fully into the southern regions of Australia. Steve VK3OT spent a lot of time calling on CW, and was rewarded by having a contact with PA0BFM on 19/10. On the same day, Bill VK5ACY was in the shack of Roger VK5NY; both heard three overs of PA0BFM from 0909, but were unable to make contact. Roger remarked that the PA0 station was giving signal peaks with the beam at first pointing north and then pointing west. It is believed Mick VK5ZDR also tried.

On 27/10 at 0250 KL7NO from Alaska was noted working VK4s. At 0254 both VK5ACY and VK5NY successfully worked the Alaskan at 5x3. Subsequently his signal rose to 5x9 and his repeated CQ calls went unanswered!

Being allowed a short visit to my home from hospital on 27/10, I observed that at 0600 VK5ACY and VK5NY were working N16E in Hawaii with 5x9 reports, though only S2 at Menigie. At 0645 VK5ZDR worked KH6ME at 5x2. At 0650 K6GSS/KH6 was 5x7 at VK5LP, so the signals were swinging around all over the place. I exhibited extreme discipline, and resisted the temptation to come on the air, due to the necessity of writing these notes!

South Africa

The ZS VHF News has arrived on my desk once more, and as their geographical location is somewhat similar to ours for northern paths, it is of interest to record some of their happenings.

The VHF News lists a number of new six metre stations. A22BW commenced on 8/9 by working 9H1JN, 9H1AW, SV1AB, ZC4MK and others. 3DA0AU contacted several stations in the Mediterranean area. From Lesotho, 7P8DP will soon be active. C31LDN is now operational and so is TA4/G3SDL. Others include EL2FO, 9Q5EE, FR5DN, TR8CA and FD1NLQ/7X.

The September summary was that conditions were below expectations, with no seasonally unusual propagation, with the exception of a brief weak JA opening on 17/9. There was propagation to the Mediterranean area virtually every day, although on a few evenings beacons only were heard. Probably the Australian scene could be viewed in a similar manner - nothing really outstanding in September except for some brief JA openings!

Peter VK1RX has done extensive computer predictions covering the Canberra to Pretoria path, and concludes that April 1990 will probably be the optimum period during Cycle 22 for six metre contacts between South Africa and Eastern Australia.

The ZS VHF News also reports that Cycle 22 is continuing to progress at a rate comparable to Cycle 19, and is now about 25% ahead of Cycle 21. Current predictions are for Cycle 22 to peak at approximately 200 around March

1990, and there is a 90% confidence level that the peak will fall between 165 and 240. Cycle 19 peaked at a record level of 201 in November of 1957. Cycle 21, the second best cycle recorded, peaked at 165 in December 1979.

Six metre operators in Southern Africa have already experienced propagation similar to that which occurred only late in Cycle 21. The first ever ZS/JA contacts were in April 1981 - two years after the Cycle 21 peak, whereas a Number of ZS/JA contacts have already been made a full year before the predicted peak of this cycle. On the North American path, the first Cycle 21 contacts were made in November 1980, almost a year past the peak, and contacts have been made already this cycle with VE1YX in March 1989. Improved equipment, and more people listening to this cycle, will account for some of these contacts, but certainly not all. If these are valid indicators, six metre enthusiasts worldwide have an exciting two or three years ahead of them.

It is certain that the above comments are equally valid for Australia, with the large number of contacts between VK8 and Europe as a hopeful indicator for VK operators who can claim contacts with six metre stations on all continents. Graham VK6RO wrote to say he worked JS6CDB at 559 on 14/10. As this station is located in Okinawa, it represented a new country for him, bringing his total to 16. Graham said that at least until 15/10, conditions in Perth had been very poor, with only a few JAs to interrupt the listening to noise!

Contests

Frank Beech VK7BC, the Federal Contest Manager, has forwarded details of the 1989 Ross Hull Memorial Contest. Full details are in the November issue of AR. The Contest period is from 0001 UTC 23/12/89 to 2359 on 6/1/90, and all authorised amateur bands above 30 MHz may be used, with points varying from 2 points per contact on six and two metres, to 50 points on 3cm. I note the 50 cm (576 MHz) band has been included, but our use of the band has been withdrawn.

The emphasis is on locator square contacts, with no contacts allowed with stations in your own square. Last year, many amateurs were not aware of their locator square, and this tended to inhibit operation. Hopefully, that situation may have changed by now, and more stations will be prepared to participate and submit a log. Provision has been made to allow operation from any other location, for a period of up to 48 hours, providing details are given. Presumably this is to allow an amateur to have a break at Christmas, or whenever he may be away from his usual location.

The National VHF/UHF Field Day Contest is again being sponsored between 0200 on 27/1/90 to 0159 on 28/1/90 and will be for any continuous 12 hour period or for the full 24

hours. There are categories for single operators on one band or all bands, plus multi-operator stations and home stations.

Scoring is two points for 50 and 144 MHz, four points on 432 MHz and six points above that band. Contacts between portable field day stations score double points, and home stations half the normal scores.

I am pleased to see that a concession I have long sought has been granted, being that any type of power supply may be used, including mains power. There are many good sites around where power is now available, and the ability to float a battery charger across a battery may encourage a few more stations to enter.

Before some people get on their soap boxes and say mains power makes everything too easy, let us consider a few more points. Many field day stations operate on 240 volts AC from an engine-driven alternator. As this field day contest is being held in the middle of summer, the risk of setting a bushfire may be diminished by such devices not being used - quite apart from the considerable cost of hiring, collecting and returning the alternator. In the light of the millions of dollars of compensation being paid out for damages from the 1980 and 1983 Ash Wednesday fires in South Australia alone, it makes one stop and think of the possible risks of starting such fires. Also, lone operators these days place themselves at some risk to person and equipment, by operating from isolated mountain sites, should they be investigated by a mob of yahoos. Should they feel this way, perhaps a usefully elevated site not far from a farm

house may give them a feeling of added security, and the ability to use some power may encourage their participation.

Other News

John Martin, VK3ZJC, has written to say that a group of Melbourne operators are evaluating the need for beacons on 1296 and 2304 MHz.

Regarding 50 MHz beacons, John makes several comments. One of which suggests that if we do have 50 MHz beacons, they would be better if situated in widely separated locations, and suggests for consideration Perth, Darwin, Adelaide, Geelong, Sydney and northern VK4. (Maybe Alice Springs should be considered in the light of the experience of the past month...5LP.) Others could be left on 52 MHz. His other comments are placed on file for the time being.

On two metres, John reports that on about 11/9 Geoff VK3ZGJ heard the VK3RGG beacon in Birdsville, at reasonable strength for two hours. The next night it was available for about 20 minutes. He was using a halo antenna on the bullbar of his Kombi van. He called CQ on 144.100 using CW and SSB, but no one responded! This is not the first time Geoff has had interesting signals from and to the outback. A year or so ago, he had a good contact into the Mount Newman (VK6) repeater on 144.900. That's a long haul from Melbourne.

Roger VK3XRS has increased power to 120 watts on 432 MHz and plans to add a second Yagi to his antenna system. Phil VK3KUB

has moved from Springhurst to Wangaratta, and plans to use his home built 1296 MHz transverter in the near future. VK3BID now has 1296 MHz equipment, but details are not available.

Peter VK6BWI, reports most operating around Witchcliffe, about 40km from Cape Leeuwin, is now mainly confined to repeater operation, with only 3 or 4 amateurs within 100km having UHF facilities. With the demise of the Busselton Radio Club, Peter obviously feels out on a limb in a good operating area.

Closure

I take this opportunity to wish everyone a safe and happy Christmas, and may the New Year bring you many contacts. These notes represent the start of my 21st year of reporting for AR.

I again thank those operators who have supplied me with information throughout the past year, and at other times. Your correspondence is always welcome.

I am also indebted to those who respond to my requests for information when I telephone them, and the others who take the trouble to phone me - one who is very regular in that regard is John VK4ZJB.

Thank you also to the Editor and the staff of AR. Your interest and consideration of my efforts has always been appreciated.

Closing with two thoughts for the month: "At times I used to trouble about what life was for - now being alive seems sufficient reason" and "Rainbows apologise for angry skies". 73. From The Voice by the Lake. **ar**

Morseword No 33

Solution on page 49

Across

- 1 Tries to take off weight
- 2 Type of gun
- 3 Grasslands
- 4 Performs
- 5 M. Marceau is one
- 6 Flans
- 7 Medication
- 8 Sound of a horn
- 9 Tags
- 10 Little brother

Down

- 1 Animal reserve
- 2 How disgusting!
- 3 Futile
- 4 Listen
- 5 Weep
- 6 Emanation
- 7 Grabs
- 8 Heave
- 9 Survival craft
- 10 Bed linen

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Audrey Ryan © 1989

QSP Call Book

Despite the best efforts in the world, the WIA 1990 Australian Radio Amateur Call Book Editor, whilst browsing through its contents the other night, found an error in the 2m repeater and beacons listings.

Murphy struck by putting the Mt Dandenong (Vic) repeater, VK3RML, in the beacons list.

It should, of course, be in the repeater list as VK3RML Mt Dandenong 146.700 MHz transmit, 146.100 MHz receive, Melbourne. **ar**

CONTESTS

FEDERAL CONTESTS MANAGER FRANK BEECH VK7BC
37 NOBELIUS DRIVE LEGANA 7277

Contest Calendar

December:

23-6th Jan. Ross Hull memorial contest, rules in November "AR"

January:

1-6th Ross Hull contest.
27-28 Second trial VHF/UHF National field day. Rules November "AR"
27-28th French contest CW section. Rules this issue.

February:

24-25th French contest, phone section. Rules this issue.

News of overseas contests is not filtering down to my desk these days. The rules for the French contest were taken from a letter that I received from the region I contests convenor, who acknowledged receipt of the VK/ZL contest rules.

To publicize the VK/ZL contest, copies of the rules had been sent to more than 60 national radio societies in all three IARU regions by the end of June. Copies went to the major amateur radio magazines. The ARRL and the RSGB acknowledged receipt. How many societies gave the contest any publicity remains a mystery: some would probably have missed publication deadlines, some will have been filed and forgotten - only time will tell, as results come in during the next couple of months.

Later this month will see the Ross Hull memorial contest. In response to requests that more emphasis be given to the higher frequencies, the scoring has been biased in favour of the UHF areas. This will no doubt encourage all those who have been lamenting the decline of UHF activity in this contest. Now is your chance; give it a go. The time period was shortened, to provide a period when the vast majority of amateurs would have at least one or two weekends available over the festive season (not all have long holiday periods, and many still have to work).

To add a little spice to the contest this year, the location rule has been changed to allow for the change of location for up to 48 hours. This will assist those who may like to take advantage of a good site for a while, or even take the family away for the weekend.

Later in January, I have arranged another trial VHF/UHF National FIELD day contest. Please give this contest a try. If it is accepted and proves popular, then my successor will be able to press for a National VHF/UHF field day contest to become part of the regular contest calendar. Then the Institute could

have an exclusive VHF/UHF field day contest, like the majority of national radio societies, but it must be a 24 hour contest.

May I wish you all a merry Christmas and a happy new year.

French Contest 1990

Traffic: Only with stations from FRANCE, FFA (French Army in Germany), DOM-TOM (departments and territories overseas). Prefixes beginning with F, TV, HW, TK...

Periods: CW begins the last Saturday of January, for 1990. Saturday 27th January, 0600 UTC to Sunday 28th, 1800 UTC. PHONE begins the last Saturday of February, for 1990. Saturday 24th February, 0600 UTC to Sunday 25th, 1800 UTC.

Bands: 80, 40, 20, 15, 10 m, on IARU segments:

CW: 80 m → 3,500 - 3,560
40 m → 7,000 - 7,035
20m → 14,000 - 14,060
15m → 21,000 - 21,080
10m → 28,000 - 28,100
SSB: 80 m → 3,600 - 3,650
3,700 - 3,800
40 m → 7,040 - 7,100
20 m → 14,125 - 14,300
15m → 21,200 - 21,400
10m → 28,500 - 28,800

Reports: RS(T), and serial number. French stations give also their department number.

Categories: Mono-operators, multi-operators, SWL.

Points: For each QSO, one point in the same continent, or three points with one other continent.

Multiplier: Per band, one point for each different department (Corsica-TK - has two departments: 2A and 2B), FFA (DA1 and DA2), DOM-TOM. The station F6REF/00 give one special point. NOTE: the station DAZREF is not a multiplier... Sum of all QSO points multiplied by the sum of multiplier points from each band.

Final Score: Sum of all QSO points multiplied by the sum of multiplier points from each band.

Awards

Europe:

For each country → 1st mono-op for 100 QSO minimum 1st multi-op for 250 QSO minimum.

Other

Continents: For each country → 1st mono-op for 100 QSO minimum 1st multi-op for 250 QSO minimum.

Logs:

Must be received before 15 March for CW party, and 15 April for PHONE party, and must be sent only to:

RESEAU DES EMETTEURS FRANCAIS
REF TEST

C/O M. PACCHIANA Christian F6ENV
7 chemin des écoles quartier St Jean
13110 PORT-DE-BOUC FRANCE

1989 Australasian Sprint Results

DAVID BOX VK5OV

56 CLIFTON STREET, HAWTHORN 5062

Entries for the fourth series of Sprints, the first under the title of "Australasian" instead of "National", were slightly down on last year, as were the scores. However, judging by comments included with some of the logs, everyone seemed to enjoy the challenge of gaining as many contacts as possible in the one hour available. The CW Sprint was held on 1 July 1989 and the Phone Sprint on 8 July, in both cases on 80 metres between 1200 and 1300 UTC.

The Adelaide Hills Amateur Radio Society and the South Australian Division of the WIA congratulate the overall winners and also the winners in the individual call areas.

Winner of the Overall Trophy in the CW spring was Alan Hughes ZM3KR by one point from Roger Crofts VK4YB. Alan reversed the situation of last year in which he was one point behind the winner.

In the Phone Sprint the overall winner was Steve Jenkinson VK3YH who also was runner-up in this section in 1988.

It was disappointing that in the CW Sprint there were no entries from four of the VK call areas and there was only one ZL entrant. However, I believe that conditions on this occasion were rather poor and the event apparently clashed with the ZL Memorial Contest. The latter fact would account for the comments from a couple of entrants about ZL stations putting out contest calls outside of the hour laid down for the Sprint.

Also disappointing was the fact that in both Sprints less than half the amateurs taking part submitted logs. The Contest manager would have been delighted to have been inundated with entries, however small.

Lists of the logs submitted, together with the points claimed, are shown below. Certificate winners are indicated by asterisks.

CW Sprint

ZM3KR*	27	VK5ADX*	21
VK2APK*	16	VK5FN	19
		VK5AGX	18
		VK5RG	14
VK3OA*	18	VK5AFO	12
		VK5ADD	11
VK4YB*	26	VK5ATT	10
VK4BIL	17	VK5AO	10
VK4TT	15		

Phone Sprint

ZL1BVK*	36	VK5ADX*	34
ZM3KR	35	VK5AFO	28
		VK5YK	27
VK1PJ*	42	VK5NVW	26
VK1BEB	20	VK5RV	25
		VK5UE	25
VK2CKW*	21	VK5KGS	20
VK20H	10	VK5ATT	18
		VK5ZD/P4	10
VK3YH*	45	VK5OV	16
		(check log)	
VK4YB*	41	VK6APK*	33
VK4NEF	28		
VK4VXX	28	VK7HX*	26
VK4CYL/P	16		

Some Operator Comments

CW Sprint

VK3OA	QRN was very high and there did not seem to be as many operators as last year.
ZM3KR	A very enjoyable contest again this year. Looking forward to next year.
VK4BIL	Good fun as usual. One hour is

about my sort of contest.
 Surprised to find so few stations operating. A splendid contest for beginners to gain confidence with the key and deserves every support.
 Thanks again for the hour of fun and frustration.
 One of the good things about it is that writing up the log only takes a short time.

Phone Sprint

VK2CKW	Enjoyable evening but very quiet. It appears contests may be going out of fashion.
VK3YH	Really enjoyed the contest again. Seemed to be fewer contestants but the band was a bit noisy. Thanks for putting on the contest, the one hour format is great.
VK4NEF	Operators a bit thin on the ground. Hopefully better next year.
VK4CYL	Operated portable from Twin Falls, 200 km south of the tip of Cape York, sitting in the drivers seat of a 4WD with the steering wheel as a desk. Not a good location for Australasian contacts but worked two UAØ's after the contest. Enjoyed the contest and looking forward to next year.
VK5RV	Surprised at the interest shown. All the contestants appeared to be enjoying the contest.
VK6APK	Thank you Adelaide Hills Amateur Radio Society for sponsoring a great sprint once again. It's not easy to knock up a good score from VK6 but really good fun trying. See you again next year. ar

Results of 13th Annual 3.5 MHz WA Contests

C WATERMAN VK6NK**Results for the 3.5 MHz CW Contest**

VK6DZF	-	2900 points
VK6HQ	-	1926 "
VK6AFW	-	1616 "
VK6RF	-	876 "
VK3XB	-	588 "

Results for the 3.5 MHz SSB Contest

VK6ELL/P	-	4844 points
VK6HQ	-	3180 "
VK6RG	-	3102 "
VK6AFW	-	3080 "
VK6AF	-	1980 "
VK6RF	-	1712 "
VK5GZ	-	1518 "

Conditions for both contents were very good with some good CW contacts with all of VK and some DX to ZL, JA, and W6.

More participation by VK6 stations would have been appreciated by all, "so how about it for the next time", it's a very friendly contest of only 3 hours duration. **ar**

New Element Discovered

It is reported that physicists at the CSIRO have now discovered the heaviest element known to science. The element, tentatively named Administratium (Ad) has no protons or electrons, which means its atomic number is 0. However it does have one neutron, 125 assistants to the neutron, 75 deputy neutrons and 111 assistants to the deputy neutron.

This gives it an atomic mass number of 312.

Since Administratium has no electrons it is inert. However it can be detected chemically because it seems to impede

every reaction in which it is present. According to Dr I M Fedup, one of the discoverers of the element, a very small amount of Administratium made one reaction that normally takes less than a second take over four days.

Administratium has a half-life of approximately three years, at which time it does not actually decay. Instead it undergoes a reorganisation in which the assistants to the neutron, deputy neutrons and assistants to the deputy neutrons exchange places. Some studies have indicated that the atomic mass number actually increases after each reorganisation. Particle movement however also becomes slower and more erratic.

As yet no practical use or advantage has been found for Administratium. **ar**

From Summerland ARC Newsletter Oct 1989

Have you advised the WIA Executive Office of your new callsign?

Use the form on the reverse of the AR address flysheet.

AWARDS

KEN GOTT VK3AJU FEDERAL AWARDS MANAGER
38A LANSLOWNE RD ST.KILDA 3183

Official Approval for New ANZAC Award

Before the Land Forces Amateur Radio Group (LFARG) could start its new ANZAC Award, it had first to obtain Australian Government permission to use the word "ANZAC".

The LFARG was able to point out that its 54 members were all past or present army personnel and that the award was to mark the 75th anniversary of the Anzac landing at Gallipoli on April 25, 1915.

It was also pointed out that it was intended that LFARG members would activate their stations annually on January 3 and on Anzac Day in connection with the new award.

In response, the Minister for Veterans' Affairs, the Hon Ben Humphreys, wrote:

"Thank you for your letter requesting permission to use ANZAC in an award to be presented by the Land Forces Amateur Radio Group.

"I have much pleasure in granting my permission. Your group have a valid association with the ANZAC tradition. All members are either past or current members of the Army and the object of your Group, to preserve and promote the fellowship engendered during the Army, is consistent with the honourable tradition of ANZAC."

The Minister concluded by saying: "I wish the Land Forces Amateur Radio Group success in their endeavours and in honourably maintaining the ANZAC tradition".

Conditions

Applicants within Australia must make 50 contacts with LFARG members, and those abroad must make 25. Multiple contacts with the same LFARG member may count, provided that a calendar month has elapsed between each QSO.

QSOs may be made on any band, using any mode, but repeater contacts are not eligible.

Claims must be supported by a log extract showing the callsign and membership number of each LFARG station worked, date and time, band and mode, and signal reports exchanged.

SWLs may obtain the award on similar terms, showing both callsigns involved in each QSO.

Applications, accompanied by A\$5 (no IRCs please) should be sent to Secretary LFARG, A J Jackson VK2ELE, 9 Louat Ave, Leeton, NSW 2666.

The ANZAC Award commences on January 3, 1990 (ie only contacts made on or after that date are valid) and further information can be obtained on the LFARG net on 3.590 MHz at 0930 UTC every Wednesday.

The award certificate is shown on the next page and is accompanied by a leaflet explaining the origins of ANZAC and its significance in the history of the two nations involved.

VE-VK on 160 m

It may not be a first, but it is novel in my experience: I've just sent a WAVKCA certificate to Bob Eldridge VE7BS in British Columbia, endorsed "SSB 160 m".

Bob only needed 22 QSOs to qualify for the award, but he kindly sent me a list of 154 QSOs with VK stations on 160 m in the six years preceding September 30 last.

Bob writes that during this period he made a special point of looking for VKs at his sunrise and that many of the QSOs were made with 100 Watts output, and the balance with 400 Watts. Among the stations worked, one used only 10 Watts and several ran on 50 Watts or less.

"I was surprised to find in 1985 that there was a path VE/VK almost every day throughout May to September. I have kept a list of VKs worked and heard on 160, and it is now nearing 200 different stations."

Pitcairn Bicentennial Award

Next year will see the 200th anniversary of the settlement of Pitcairn Island by Fletcher Christian and his fellow mutineers from the HMS Bounty.

A delightfully easy-to-win award is being offered to mark the occasion. It is in the form of a 28 x 35.5 cm certificate featuring a painting by the famous Bryan Moon.

The award is available to amateurs, SWLs and Pitcairn enthusiasts in general. However, awards sent to amateurs and SWLs will carry gold endorsement stickers not available to others.

The award period is from 0001 UTC January 1, 1990, to 2359 UTC December 31, 1990. Only one QSO with a VR6 station is needed to qualify for the award, and during 1990 these stations will be using the special callsign VR200PI followed by the last two letters of their normal callsign.

There are other rules relating to obtaining QSL cards which are too lengthy to reprint here. In any event, applications for the award whether from amateurs, SWLs or interested observers, must be made on a special form obtainable from the Award manager, Dr G O'Toole KB6ISL, 9605 San Gabriel Av, So Gate, Cal 90208, USA. This form also contains full details regarding QSL cards and other details of the award not outlined here.

The initial award costs US\$5 or 14 IRCs, with US\$1 or 3 IRCs and SAE for later endorsements.

I have written to KB6ISL asking if he has any objection to my making copies of the application form and rules available to WIA members for a nominal fee, and will advise readers of his response in a later issue of AR.

Defunct VK Awards

I'm extremely grateful to Dave Handscomb VK6ATE for help on several matters.

First, he has sent me a mountain of information about the Twenty-Eight Chapter of 10-10 and about 10-10 itself. I plan to share this information with AR readers early in 1990, since it appears to be some years since AR published a run-down on what 10-10 is all about.

More immediately, Dave has thrown some light on several of the awards which I listed as "missing, presumed killed" in my October column.

Dave assures me that the Blue Mountain Lagoon Award (VK2), the Sun Valley Award (VK4), the Power Valley Award (VK3) and the Coral Sea Award (VK4) are all now definitely QRT, and that all were 10-10 products.

Meanwhile I have learned from other quarters that the worked Rockhampton Award (VK4) is alive and well, and that its custodians can be found at Box 496, Rockhampton 4700. This award costs 5 IRCs to VKs or anybody else.

WIA 80 Award

November 1 was the start-up date for the award commemorating the WIA's 80th anniversary, and judging from activity on the Family Hour net on 14.227 MHz each night, I'll soon be receiving a lot of applications for it from the USA.

Like some other VKs, I was taken by surprise when K and W stations asked me for my WIA membership number. It took me a couple of minutes to unearth my certificate from the files.

Don't let this happen to you. If you don't carry your membership number in your head, keep it by you in the shack. Failing that, the code number on the address label of your copies of AR can be given.

However, be sure to let the other station know whether the number given is from a membership certificate or an address label.

QSOs with US stations seeking the WIA 80 Award are helping me along at a good rate of knots towards my ARRL WAS Award. In case you missed it, the rules for the WIA 80 Award were published in the September issue of AR, p4.

Connecticut DXA

The Connecticut DX Association (CTDXA) is offering a new award, (pictured below).

DX stations need to contact only three CTDXA members, and SWLs need only provide call signs, time, date, mode and frequency of five QSOs involving a CTDXA member. All modes accepted, but repeater contacts not valid.

Log extracts (not cards) should be sent to Richard Moris, KB1LE, 46 Collins Rd, Bristol, CT 06010, with three IRCs. KB1LE can also supply a list of CTDXA members on receipt of a SASE.

The CTDXA is well known and widely respected both in the USA and internationally. Its members include Don Search W3AZD, the ARRL DXCC Administrator, who comments that "the Connecticut DX Award is a natural addition to the avid DX chaser's shack". Another active member of CTDXA is Frank Cooper W3NV, currently on the ARRL DXCC honor-roll with 313 countries confirmed.

Awards Issued Recently

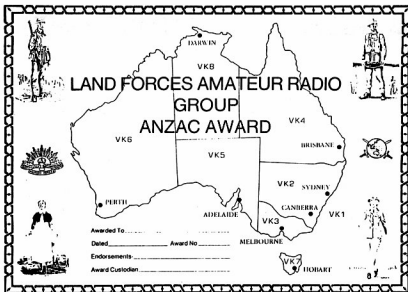
WAVKCA (VHF)

- 38 Shinroku Kido JA6LLA (6m)
- 39 Yoshifumi Tanaka JE2IHH (6m)
- 40 Yiyoshi Mizutani JR2HCB (6m)
- 41 Masaya Hirota JA3IHW (6 m)

WAVKCA

- 1790 Alexander Sanchez TI2SAH
- 1791 Frank Cook KA6CJL
- 1792 Sean Carvin EI2CR
- 1793 Scott Travis KB5GEC
- 1794 Arnold Andersson SM5CIK
- 1795 Bob Eldridge VE7BS
- 1796 Shuichi Mochizuki JE1CCD
- 1797 Hans van Loenen PA3ADS
- 1798 Akira Nakamura JA1ASO
- 1799 Max Muhammad YC0HET

ar



WIA NEWS

Continued from page 6

the Amateur Service, has been available for several months; DOC 72, Operating Procedures for the Amateur Service, became available a few weeks ago; and now we have DOC 70, which is of vital interest, particularly to prospective amateur operators.

DOC 70 details the qualifications required to obtain an Australian amateur

licence, the various grades of licence, examination arrangements and exemptions, licensing of club, repeater and beacon stations, a schedule of countries with which Australia has reciprocal qualification and licensing agreements and, most importantly, the format and syllabus for each of the amateur examinations.

ar

POUNDING BRASS

GILBERT GRIFFITH
7 CHURCH STREET BRIGHT 3741

C M Howes Communications make two types of dual-bandwidth audio filters. The CSL4 has a CW bandwidth of 300Hz at -6db, and the sharp SSB rolloff means that unwanted signals are over 50dB down at around 3.3 kHz. It is designed for use on the C M Howes series of receivers but can make an improvement on most receivers.

The CSL5 filter offers the same performance as the CSL4, but being an external filter it simply connects to the receiver's external speaker or headphone jack, and has an on-board 1W output stage to suit 8 ohm loudspeakers (or higher at reduced power). The ASL5 can even be upgraded by adding the ASL4 module, to give a two stage filter with even steeper skirts, all the connections are detailed in the instructions. All the active filtering is done by the TA75074P IC and the amplifier is an LM380 IC. These, together with 43 resistors and 35 capacitors fit on a board which measures 51 by 108mm and you will need a screened case to prevent the usual stray radiation found in the shack from interfering with the signal. A fine tipped iron as well as a steady hand (or a hand-rest) is essential, and I used IC sockets rather than soldering the IC's directly into the board. The extras list is short, consisting of the case, IC

sockets (opt), jack sockets for input and output, and a one pole three way switch to select either wide, SSB, or CW. If you use a battery supply, you will need a switch and maybe a led indicator.

There is not much to say further about such a simple kit, I found that it was superfluous when used on my IC751A, as that rig already has all the filters available (plus an Icom audio filter designed for the IC740), but the improvement on both my homebrew receivers was much appreciated, especially as they are direct conversion and not very selective. The ASL5 made listening much easier and less tiring. Contact: C M Howes Communications, Eydon, Daventry, Northants, NN11 6PT, England. (who supplied the kit).

I am again in a rush to beat the deadline for this month, after spending the whole week getting ready, and the weekend lifting my tower back up. Even though it tilts over, I have fitted steps to it, so that I can climb up for adjustments. My 160 metre dipole still needs replacing, but everything else is OK. Hope to see you on air soon.

Merry Christmas and have a happy New Year.

73's Gil VK3CQ.

ar

ANTENNAS & ACCESSORIES

We manufacture a comprehensive range of HF, VHF and UHF antennas, baluns, power dividers etc to suit your application.

Three of our log periodics provide continuous coverage from 13.30 MHz including WARC frequencies, and replace outdated tri-banders. Now in use in 24 overseas countries and 6 continents.

- CREATE ROTATORS, COAX CABLES & NON-CONDUCTING GUY HALYARD MATERIALS
- COMPLETE RANGE MIRAGE (USA) 5-YR WARRANTY 6M, 2M, 70CM AMPS & WATT SWR METERS
- HARD-DRAWN ANTENNA WIRE
- AUST/NZ DISTRIBUTOR FOR CREATE ANTENNAS/ROTATORS & PHYLSTRAN (KEVLAR) NON-CONDUCTING GUYING MATERIALS
- HIGH GAIN VHF & UHF AMATEUR, SCANNING & TV ANTENNAS
- BUTT SECTION TRIANGULAR ALUMINIUM TOWERS FOR FIXED OR TILT-OVER APPLICATIONS (REFER MARCH/APRIL 1987 AR)
- SELECTION OF POWER CHIPS AT FRIENDLY PRICES
- VSWR/PWR METERS TO 1300MHz

Write or phone for free catalogue

ATN ANTENNAS

56 Campbell Street
Birchip Vic 3483
Phone: (054) 92 2224
Fax: (054) 92 2666

VHF COMMUNICATIONS MAGAZINE

1990 Subscribers

Make sure you send your subscription for VHF Communications Magazine separately to:

"VHF COMMS"
PO BOX 300
SOUTH CAULFIELD
VICTORIA 3162

By January 31st. 1990

NEW PRICES:

Airmail Subscription: \$40.50
Surface Mail: \$28.00



"... and another thing: I'm always careful to leave the wireless room looking exactly as I found it when I joined the ship."

Contributed by Gil Griffith

WICEN

GUEST AUTHOR: ALAN DIHM VK3ADK
PO Box 106 MITCHAM 3132

WICEN at the International 3 Day Equestrian Event

On Saturday 14th October, 40 operators attended the International 3 day Equestrian Event run by the Victorian Equestrian Association at Werribee Park. The event included the Trans Tasman Cup (a teams event against New Zealand), selection trials for the Australian team for the World Cup, and was also used by the State Government, as an exhibition event to promote Victoria's bid for the Olympic Games. WICEN's role was to provide safety and scoring communications for the cross country section on the Saturday. The event involved many international and interstate competitors. On the first day the competitors went through exhaustive dressage tests. The second day was divided into four consecutive stages - A (road and track work), B (steeplechase), C (further road and track work), and D, which was the cross country stage. The third day was show jumping.

The WICEN operators were required for stage D only, to pass safety and scoring traffic. Stage D comprised 27 obstacles over a course of about 6.5 kilometres, and had an optimum running time of 11 minutes. Horses were to

be dispatched at 3 minute intervals, so a quick calculation indicated a scoring type message every 8 seconds at worst, plus any safety traffic. Safety traffic would be passed to the event director at our net control room for action. Any resulting messages would be passed back to officials at each obstacle via an operator with each official. A link was to be provided via UHF CB to an SES net, which linked the start of stages A, B, C and D and the crash crews, doctors, vets, St Johns Ambulance, the horse ambulance and the SES. This net would also send section times to another location.

In order to accomplish our tasks, four networks were set up. We used three VHF nets and one UHF net; three for scoring and one for liaison. Because of possible desensitising problems, one of the VHF nets had a remote base station and was linked through a UHF translator to net control. None of the checkpoints was further than two kilometres from net control, so the field operators could use handhelds on low power. In places where vehicles could be kept out of the field of view of the TV cameras, operators worked in vehicles if necessary.

In practice however, we provided additional operators at the start of section A, the finish of section D, at 3 emergency stopping points and at the SES bus. This was achieved by using one operator to cover more than one

jump official, where the obstacles were close together and our efficiency would not be compromised.

Net control was in the (National Trust classified) mansion, and was luxurious when compared with the usual facilities at other exercises. We had plenty of power points, phone, large tables, whiteboard, lots of chairs and an urn. The organisers provided lunch for all operators.

Our communications worked well all day. There were some dramas out on the course, and some hectic moments at net control. When required, horses were stopped, the doctor called, crash crews dispatched, and the event stopped and started efficiently, because of our reliable communications. Officials at the jumps remarked to us how much easier their job was with a radio operator with them to relay messages.

The "real time" scores that we sent in enabled the TV commentators (channels 7 and 9) to give up-to-the-minute progress scores as they made their commentary.

The organisers were delighted with the service provided by WICEN, and suggested that we would be very welcome next year to provide the same or possibly an expanded service.

As always, the excellent communications did not just happen but were the result of much planning. Thanks to all operators, and particularly to Leigh VK3TP, Jamie VK3KPU and Dave VK3UR whose planning and efforts culminated in a very successful exercise, which has undoubtedly enhanced the reputation and public awareness of WICEN and amateur radio. ar

AMSAT

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON 5074

National Coordinator
Graham Ratcliff VK5AGR

Information Nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC Sunday
Bulletin commences: 1000 UTC
Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz

AMSAT SW Pacific
2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 270 subscribers. Should you also wish to subscribe, send a cheque for \$20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box, 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must"

for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk, and a nominal donation of \$10 per item, to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

Decay of Oscar-9

**From UoSAT-OSCAR-11 Bulletin 202
27th October 1989**

UoSAT-1 decayed on Friday 13th October 1989 at 0751.49 GMT on orbit 44761 around 49.2S 220.9E and 46.4S 220.0E (in the South Pacific area). Any telemetry or reports from the last 6 hours of UO-9's life would be appreciated by the University of Surrey.

Microsat/Uosat D & E Launch Delay

Further to the information given last month, the launch has been rescheduled for 19 January 1990. The additional delay is due to the launch "window" required for the primary payload on the launch vehicle.

The following is from AMSAT-NA Bulletin 287.03, 14 October 1989.

Arianespace Announces The MICROSAT & UOSAT D/E Launch Date of Jan 19 '90.

This week Arianespace formally notified AMSAT-NA and University of Surrey officials that the new launch date for the MICROSATs (PACSAT, LUSAT, DOVE, and WEBER-SAT), UOSAT D & E, and the primary payload, SPOT-2, is now planned for January 19, 1990. The launch campaign will begin six weeks prior to the launch date.

The announcement of the launch delay two weeks ago came as a complete surprise to both AMSAT and University of Surrey officials. Both groups were in the final phases of getting their satellites ready for the trip to Kourou, French Guiana in order to start the launch campaign on October 2nd. The launch delay announcement came only hours before the MICROSAT Launch Team was to leave for Kourou, and twelve hours before the University of Surrey Team was to depart. This extra time will certainly not be wasted by either AMSAT or University of Surrey Teams. The delay will allow more time for correcting minor hardware problems which appeared during thermal vacuum and vibration testing. The UOSAT D & E Team have been performing extensive testing of the CCD camera picture taking software with this extra time. The MICROSAT Team will continue to test the AX.25 packet protocol software along with the bulletin board feature they have incorporated.

OSCAR-13 October Woes

October was not a good month for Oscar-13, which suffered two dramatic "crashes". The first was on Monday 9th October and the second on Sunday the 29th. The following article from AMSAT-NA Bulletin 287.01 (14 October) describes the first incident.

AO-13 Temporarily Out Of Service Due to IHU Crash; Returns To Service 13th October 1989.

OSCAR-13's onboard computer, commonly referred to as the Integrated House-keeping Unit (IHU), this week suffered what electronic experts call a "Single Event Upset" (SEU). This is a condition that is caused when a high energy particle, a proton, enters a memory "cell" in a computer chip and actually "flips" the bit from a "1" to a "0" or visa versa. In the case of spacecraft, the high energy particles are usually the by-products of solar

flares and they wreak havoc on Random Access Memory (RAM) chips and microprocessors on satellites. Such bit flips generally have the disastrous effect of causing the software running on spacecraft microprocessors to crash. The first notice that the IHU software was running amok was discovered early Monday morning, Oct 9th between 0720 UTC and 1115 UTC on Orbit #1012. The first reports received said that the telemetry beacon was sending an unmodulated carrier, and that OSCAR-13 was in Mode B at the wrong Mean Anomaly (MA) count according to the recently published schedule. Also, it was using the omni-directional antenna instead of the high-gain antenna as it was supposed to. Almost immediately upon hearing this, DB2OS, G3RUH, and VK5AGR, AMSAT Ground Command Stations, went to work to start restoring the IHU. By late Monday night, DB2OS was able to send a "reset" command which restarted the IHU from scratch. To home computer users, this is the equivalent to doing a soft reboot. Peter was then able to load a simple routine that allowed safe operation of OSCAR-13 especially during solar eclipse periods around perigee; this simple routine did not allow any transponder operation, nor did it allow telemetry to be sent. Once the reset command was sent, then the tedious and laborious task of reloading the flight software to OSCAR-13's IHU began.

Complicating this effort was the combination of high squint angles and noise generated from ground radars. Eventually all the software was reloaded, and DB2OS and other ground stations then started to examine the IHU's 1802 microprocessor and all of its memory to see if there was any damage done. At the present time, the general consensus is that there was no hardware damage! This was hopefully, an isolated event which was associated with a severe solar storm that occurred several days before the IHU crash. OSCAR-13 has returned to service as of Friday, Oct 13, 1989 at 1330 UTC. The following will be the transponder operating schedule until further notice:

Bahn Attitude 208/-3 Omni Antennas from MA 240-060

Mode-B: MA 003 to MA 160

Mode-JL: MA 160 to MA 200

Mode-B: MA 200 to MA 240

OFF: MA 240 to MA 003

Mode S users will note that there is no Mode S transponder operation planned. However, it is anticipated that it will be reinstated shortly.

New RS Launch Planned

RS14 and RUDAK 2 to fly piggyback on GEOS - Nico PAODLO @ P18ZAA

During the DATASPACE 89 Colloquium at the University of Surrey in England around July 30, the following information on the new RS14 and RUDAK 2 systems were supplied by Leonid, UA3CR, and members of AMSAT-DL.

The Russian ORBITA organization is constructing a new amateur satellite system, Radio Sputnik 14, which contains a linear mode B transponder. Meanwhile, AMSAT-DL is building a new RUDAK digital packet repeater. These systems are to be built into a new Russian experimental Geological Survey satellite. For the time being this satellite is indicated as "GEOS", but after launch it will probably be known as a satellite in the KOSMOS series. During the Colloquium at the University of Surrey, preliminary agreement papers were signed by representatives of ORBITA and AMSAT-DL.

GEOS is to carry a transponder, which will be used to relay geological data between geological research stations and their base station. This transponder will be in the UHF range, not far from the 70 cm amateur radio band. The electrical power for the RS14 and RUDAK 2 systems will be delivered by the GEOS power system. GEOS is currently planned to be launched in the middle of 1990 into a circular orbit at an altitude of around 1000 km and with an inclination of about 83 degrees.

RS14 will contain a mode B transponder, a telemetry system and two beacon transmitters. One of these beacons will also be used as the downlink for RUDAK 2. The uplink frequencies of the transponder are planned to be between 435.080 and 435.180 MHz and the downlink frequencies between 145.850 and 145.950 MHz. The transponder will be inverting and its maximum around 145.850 MHz. The second beacon on 145.990 MHz can be switched between RS14 CW telemetry and the RUDAK 2 downlink. When the mode B transponder is in operation this beacon will have an output power of 2W. When the transponder is off the beacon will transmit at full power, i.e. 10 to 12 W. Note: All frequencies may change before launch!

The RUDAK 2 digital repeater is very similar to RUDAK 1, which is on board OSCAR 13 but failed to operate well. This digipeater can be used to relay packet radio messages using the AX.25 protocol. There will be two uplink frequencies and one downlink frequency on RUDAK 2. The first uplink is planned to be on 435.00 MHz and is to be used for 1200 psk FSK. The second uplink is planned on 435.150 MHz and is to be used for 4800 psk FSK. The RUDAK 2 downlink on 145.990 MHz will transmit 1200 psk PSK. The combined antennas of RS14 and RUDAK 2 will be monopoles for 2 m and 70 cm.

The launch of GEOS is expected to take place from the launch centre near Plesetsk in the north of the USSR. Representatives of AMSAT-DL may be invited to be present at

the launch. Leonid, UA3CR, has promised to try to set up a launch net on amateur radio frequencies, so that everybody may witness the launch when it happens. Also, Leonid will try to present before the launch as much information as possible on the launch details, on the planned orbital parameters, etc.

Meanwhile, the RS12 and RS13 transponder systems, which will fly on board a KOSMOS navigation satellite, are waiting for a launch possibility. RS10 and RS11 are now operating from the KOSMOS 1861 navigation satellite. This KOSMOS is on stand-by because its predecessor is still functioning very well. As soon as the old KOSMOS fails KOSMOS 1861 will come into operation and the new back-up KOSMOS, with RS12/13 on board, will be launched. Nobody knows when this will happen. Therefore, the launch may have to be delayed well into 1990.

Several Eastern European countries are co-operating on a new amateur radio satellite project: RS15. This satellite is to carry several transponders and beacons. Details are not yet available. parts of this new satellite are being developed now by the Budapest University team of Bandy, HA5WH. The launch of RS15 is not expected before 1993.

ar

Support the advertisers
who support Amateur
Radio magazine.

DATA AND DIGITAL

GUEST AUTHOR: PETER BROUGHTON VK3AZQ
9 ANDREWS ST BURWOOD 3125

An Introduction to Packet Radio

Packet Radio is becoming very popular and an increasing number of radio amateurs, who already own a personal computer or (PC) are seeking for information on this subject. I have therefore decided to use my PC to extract a condensed version of some of the information at hand, to pass on to those of you who are interested in this fascinating hobby.

Packet Radio in the amateur community is producing something of a revolution in high speed communications. There are many advantages to using this form of communication by comparison with other digital information which the computer can so easily provide. It has already changed the way we live and no doubt will continue to be used as a creative tool which automatically handles

the arduous task of sorting and filing.

Packet Radio is extending its tentacles into amateur radio as part of the information revolution. New forms and improvements are occurring at an ever increasing rate and standards are being established to combat the sort of obsolescence to which the earlier enthusiasts were subjected. The terminal node controller (TNC) is changing the way we communicate, and soon PC operators will be asking how they managed to do without it.

The Advantages Over Other Systems

We hear a great deal about digital communication these days, but if you think back, you must admit that CW, radio teletype (RTTY) and more recently amateur teletype over radio (AMTOR) are, after all, only digital forms of communication.

OSCAR-13 Schedule for 1 December 1989 to 8 January 1990
Station: Adelaide

	Hour - UTC																							
01Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
02Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
03Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
04Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
05Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
06Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
07Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
08Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
09Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
10Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
11Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
12Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
13Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
14Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
15Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
16Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
17Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
18Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
19Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
20Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
21Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
22Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
23Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
24Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
25Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
26Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
27Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
28Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
29Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
30Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
31Dec	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
01Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
02Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
03Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
04Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
05Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
06Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
07Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
08Jan	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

LEGEND: B Mode B visible; L Mode L visible; - satellite below horizon

In its most basic form, packet is simply a faster way for radio amateurs to pass information from one station to another. Also, it has added to the quality of information exchange, and it is 1000 times faster than AMTOR.

HF packets operate at a speed of 300 baud, which is 5 times faster than RTTY. On VHF, packets operate at speeds of 1200 baud, which is 10 - 20 times faster than RTTY. A data rate of 4800 baud is being used experimentally, and data rates of 9600 baud are soon to be tested for the new data highway, linking Queensland with Victoria.

Packet supports the transfer of binary data from computer programs, and is the only error-detecting mode supporting the full ASCII encoding. It is now possible to locate a radio amateur using such sketchy information as his call sign, and be provided with details of his activities without him being personally involved during the contact. If he has packet equipment, text, data, graphics or video information can be left on a database to be automatically passed to him or collected even in adverse conditions, such as one could expect on the HF band.

The advantage of error detection and networking may be supplied to voice and video signals. The technique addressing enables repeaters to relay packets of information from one station to the next, thus forming a network. The protocol used in Packet Radio is much the same as two strangers who meet and introduce themselves before starting a conversation, first by shaking hands and exchanging credentials - "My Card". Protocols are usually referred to as etiquette, and in Packet Radio can be lengthy, because they have to cover every action and event that is likely to occur. CW uses a simple form of protocol in the transmission of single tones according to an agreed code; RTTY uses two tones and the information is transmitted back and forth between them by using frequency shift keying (FSK) to an agreed code, but no protocol is required. AMTOR enhances RTTY and uses a protocol for selective calling, error detection and acknowledgement. Packet uses the ASCII code for the passage of text although binary data (object code) and digitised voice, video and telemetry may be transmitted equally well. Packet uses FSK just as RTTY does, but the modulation technique is not required.

Protocols are the major source of packet power and usefulness and are essentially written in software. American radio amateurs have opted for a software protocol called AX.25, which is a version of the international X.25 protocol used commercially for the transmission on information packets.

Packets are made up of frames, which

consist simply of a series of zeroes and ones. The frame begins with a flag to identify it, and the first frame contains the callsign of the sending station, the station intended to receive the frame and all those stations that are to repeat the frame on the way to its destination. Then a field identifies the type of frame sent: connection request, acknowledgement, or status polling and if data is to be sent, the protocol field is followed by a packet of data. Next comes an error checking field which tests frame accuracy. If an error exists, no attempt is made to correct it. The frame is discarded and retransmitted.

A schematic representation of the frame is shown below:

Flags	To Call	From Call	Control	Data	Frame Check Sequence

Protocols make networking possible. Packet stations can extend their range by using other packet stations as repeaters. In fact, any packet station can be a digipeater. A packet station listens to every transmission on the frequency, to see if the message is addressed to it or to be repeated through it. Packet Radio usually has a well organised mail box system, called a Bulletin Board, and some of them remain in operation on a 24 hour basis.

Software provides the major changes in packet radio, and this gives assurance that there will be no call to replace costly equipment as new methods of operation evolve. A growing number of operators use a small

plug-in card in one of the expansion slots in their computer. So the result is a very neat layout, requiring little more space to operate in this new mode over conventional computer usage.

I have no wish to dampen your enthusiasm at this stage, but be warned. An IBM compatible computer is essential if you want to use the system up to present day standards. You will need at least 640K of RAM to cope with the latest software programs, two 360K disk drives and a bi-directional printer can save an awful lot of waiting time as well.

For those enthusiasts who cannot afford to purchase new equipment but already own a C64, Macintosh, Rabbie 65, 6809 H/B, VAX, Amstrad, Amiga 1000, C128, NEC 8801, Microbee, TONO7000E, Sharp, TRS80, Toshiba, Bondwell, COCO, and BBC-B take heart; there are packet users out there with the same equipment.

The most cost saving exercise for the uninitiated however, is to join a progressive packet radio club, such as the Melbourne Packet Radio Group, and gain the benefit from the advice they can give you to start you in the right direction.

Reference

A Packet Primer
by Gwyn Reedy W1BEL
73 Magazine August 1986

ar

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VH7RH

52 CONNAUGHT CRESCENT WEST LAUNCESTON 7250

Firstly, I must apologise for the failure of this column to appear in November, but due to the non-delivery of Australia Post by the deadline time of the copy, you were not able to see it.

We are now in the D-89 period, and conditions are very good. It does now appear as if we have passed the peak of the current Sunspot Cycle in September, just as had been predicted by the Brussels Sunspot Centre. On the eighth of September, the Solar flux was at 304, the highest on record. Not surprisingly, HF propagation around that period was excellent. The 11 meter broadcasting allocation was very good, with signals coming in from South Africa, the USSR, France, Belgium, the UK and Norway around 1100 and even earlier, Denmark and West Germany were heard, 21 MHz was also extremely lively and there weren't many vacant channels.

During September, the Caribbean and the east coastline of the USA, especially in the Carolinas and Georgia, were hit by Hurricane

"Hugo". Severe damage was reported from Guadeloupe, the British and American Virgin Islands, Puerto Rico plus other West Indies islands. The joint BBC-Deutsche Welle relay base at Antigua was off-air for a few days following "Hugo", but is now operational. Although Montserrat was badly affected, the relay base there had been closed just a few weeks prior to the Hurricane.

I know that many listeners were able to follow "Hugo's" path via amateur radio. The Hurricane Net on 14325 kHz was carrying traffic between the Caribbean and the States. Other channels were pressed into service to handle Health & Welfare traffic. Propagation conditions were abysmal, and the behaviour of some amateurs within the USA was appalling. All nets experienced deliberate interference, which led to frayed tempers. Fortunately, the American FCC were monitoring these channels and reportedly traced several sources of this QRM. I am sure that they are in for a nasty surprise.

Solution to Morseword No 33

From page 46

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Across: 1 diets; 2 bren; 3 leas; 4 acts; 5 mimier; 6 tarts; 7 dose; 8 beep; 9 tabs; 10 bro.

Down: 1 zoo; 2 ugh; 3 vain; 4 hear; 5 sob; 6 aura; 7 takes; 8 heft; 9 raft; 10 sheet.

ALARA

JOY COLLIS VK2EBX
PO BOX 22 YEOVAL 2868

Then on October 17th at 0004 UTC, San Francisco was shaken by a severe earthquake. Radio KGEI went off the air, as did coast station KFS, but Family Radio's transmitters are in Florida and they temporarily lost the feed from the studios in Oakland (CA). Communications were severely disrupted and again amateur radio came into prominence. Within hours, several nets were operational, particularly on channels previously used during Hurricane "Hugo". The behaviour was better, as most amateurs were only too aware that Ham radio was the only mode of communications for 24 hours to the general public.

Australian amateurs should remember that, during emergency conditions, the FCC has designated 14275 and 14325 as emergency or priority frequencies and if you hear emergency or priority traffic, please QSY + - 5 kHz from the channels. Adjacent splatter played havoc with net control stations trying to copy stations operating on battery power and rudimentary antennas.

Radio Australia is changing the emphasis of its programming from Sunday December 3rd. They are going to concentrate on Asia and the Pacific, particularly on English programming. A new program schedule has come into effect, and it would pay you to obtain one from Radio Australia, GPO Box 428G Melbourne Vic 3001. These changes follow the recent review by RA's parent body, the ABC. One important change was the proposal to delete the Japanese language service from HF. This was surprising, as I'm led to believe that RA's Japanese programming was popular. Perhaps RA will have second thoughts when the protests come rolling in from Japan.

Radio Canada International has introduced a daily service in Standard Chinese (Putonghua) as from the first of October. It is from the NHK site in Yamata, Japan on 15270 and 17810 kHz from 1300 till 1330 and on 6150 from 1500 till 1530. RCI has been very careful not to use the Xian site in the PRC for the Chinese, but only for the Japanese service and English Service to Asia. Incidentally, you can hear Montreal on 11955 from Xian and 15210 at 1200 to 1230 and from 2200 till 2230 on 11705 from Yamata, Japan. Both are to Asia in English.

Don't forget the BBC World Service Christmas Day Special at 0930, with the Queen's Christmas Message followed by the Festival of Nine Lessons and Carols from Kings' College, Cambridge on the usual WS frequencies. And that leads me to wish you all a happy Christmas and that 1990 will be what you would desire.

The vacancy for a second Vice-President of ALARA has now been filled by Christine VK5CTY. Congratulations Christine.

ALARA Contest

Next month it should be possible to give a report on the Contest, and hopefully this year we will have a winner for the Florence Mc Kenzie CW Trophy.

The first winner of this prestigious Trophy was Jill VK4VNN (now VK4ASK), followed by Bobbie VK2PXS, who surprised herself by winning it in 1986.

Liz VK3PSG (now VK3JQ) was the 1987 winner, and unfortunately 1988 saw no contestant enter for the Trophy.

Hopefully this year it will once again be awarded in memory of the lady, who trained so many in the intricacies of Morse Code prior to and during the second world war, and made such a valuable contribution to amateur radio. ALARA is proud to perpetuate the memory of Florence McKenzie through this competition, and I'm sure if she were alive today, she would thoroughly endorse the suitability of this remembrance of her name.

Family Membership

Following a recent decision, a person who is a resident member of a family which includes a full member of ALARA can become an ALARA member by paying a subscription

of 50% of the appropriate rate. Such a person is to be known as a Family member, who does not receive a Newsletter.

JOTA

For the first time in nine years, I was unable to participate in JOTA this year, due to other commitments, which was disappointing.

I have been informed by ALARA members who did take part that conditions on the 10, 15 and 20 metre bands were poor, due to the solar flares, and that few DX contacts were possible.

However, some worthwhile contacts were made intrastate, interstate, and with New Zealand, many of them via satellite, which was of great interest to the scouts and guides concerned.

Hopefully next year conditions will be better.

Annual Electronics Sale

On November 4th, the Adelaide Hills Amateur Radio Society Annual Electronics Sale was held.

This has proved a popular event. It is not only amateur radio equipment that is sold, but any electronics gear.

On this occasion, ALARA assisted by running a hot drink stall, which was much appreciated by thirsty patrons.



Yasuko JL3EGP & Atsuko JP3DHT Glenelg (Adelaide) August 1989.

Have you
advised DoTC of your
new address?

YL Contest

DLYC Mid-Winter Contest:

CW: Saturday 13th Jan 1990 from 0700 to 1900 UTC.

SSB: Sunday 14th Jan 1990 from 0700 to 1900 UTC.

Award Update

No 151 27/6/89. Meg Box VK5AOV. 2 stickers.

Bits And Pieces

Profuse apologies to Coral VK8NCH and Carol VK8NCA for getting them mixed up! Coral VK8NCH is, of course, the recently elected President of the Darwin Amateur Radio Club, not Carol VK8NCA as reported in October AR.

ALARA members were well represented in the Craft section of this year's Royal Melbourne Show; Marilyn VK3DMS collecting a first prize for her soft toys, Gwen VK3DYL and Barbara VK3BYK walking off with prizes and "commendeds". Congratulations

Maria was very happy to meet Yasuko JL3EGP and Atsuko JD3DHT when they visited Adelaide in August. Both ladies were given a "whistle stop" tour of the city and surrounds, chauffeured by Maria, and enjoyed themselves immensely.

Josie VK4VG would like to see more YLs join her net on Tuesday evenings, 0930 UTC on 3.570 +/- . If this day is inconvenient, why not let her know, and she may be able to arrange a different evening.

Marlene VK3FML recently tried her hand at a little home-brewing, making herself a



BYLARA 10th Anniversary Rally Drayton Manor Park 14th May 1989.

QRP CW rig with output of 4 watts. Apparently it is working very well, and Marlene is quite pleased with the success of her project.

Denise VK5YL scored a week in Japan in early October. While there, she climbed Mount Fujiyama, and had a little more excitement than she bargained for when a 5.9 earthquake struck.

Anny DF2SL was on the 14.222 YL net on 16th October with special call sign DL0XYL, and Florence F6FYP made many YLs happy on 30th October with CN2YL. This was a new YL country for most of us.

Please note new address for Mary Ketzler KA0OMH, DX contact for YLRL: Rtl, Box 194AA, Mondovi, WI 54755.

Congratulations to Margaret VK4AOE who recently became a great-grandmother.

New Members

Welcome to new members: Iris GØFIW, Pat VK4MP, Mina VK8MM, Erika VK3AEB and Jennifer VK3MDR. Great to have you in ALARA.

My old antenna was a mess

My new one is so neat...

My old one worked across the world,

My new one across the street!

(From WARO Bulletin - September 1989.)

Seasons greetings to all,

73/33

ar

OSLs FROM WIA COLLECTION (20)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3191

Former British Colony In East Africa

The former colonies of British Somaliland and Italian Somaliland form present-day Somali. This republic lies in the north-east corner of the African continent, the so-called "Horn of Africa". The country is bounded by Ethiopia and Djibouti to the west and Kenya to the south. Its area is just over half a million square kilometres which makes it a little smaller than NSW. In the days of the two East African colonial powers, the British col-

ony lay to the north-west bordering on French Somaliland (now Djibouti), while the Italian colony lay to the east.

British Somaliland was established following treaties with local Sultans, Britain's initial interest being mainly logistic. Colonisation was primarily due to the demand for an uninterrupted supply of meat cattle to feed her garrison stationed at Aden. Of course, after the opening of the Suez Canal in 1869, the strategic importance of the coastal towns of the colony increased enormously. This led to treaties that established in 1884 the Somali Coast Protectorate which subsequently became known as the British Somaliland

Protectorate. This territory was administered by the India Office in London, responsibility passing to the Colonial Office in 1907.

Italy having entered World War 2 in June 1940, Italian forces invaded the colony, but were defeated in the following year. The two Somali colonies (British and Italian) became administered by a military governor assisted by an army council and this arrangement continued until 1949.

MD4BPC

The Bureau International de L'Union telegraphique of Berne had allocated the prefix M (together with B and G) to Great Britain even before World War 1. Of course, in those days such an allocation was not for the benefit of the handful of radio experimenters that existed, but for ships and the land stations with which vessels were in contact by spark telegraphy. As pointed out in earlier articles, experimenters were not given use of these

MD4BPC

Royal Signals, C/o British Somaliland Signal Section
HARGEISA.

To RADIO V K 6 R U Confirming CW/QSO on 12 Jan 1948

at 1425 OMT Ur Sigs RST 5 7 9 on 14 MC S.

Remarks Yy used to meet u Jim es hpe to a 73's es Good luck.
Pse/Tnx QSL Direct or Via RSGB. u mni times W. H. Caunter.
more. This is second CW crd so u shud get P's SQMS. *Bill*

allocated prefixes until the late 1920's. The prefixes which were used were in effect, abbreviations of the names of their countries. Nevertheless, just before World War 2 the M prefix surfaced for the first time in amateur radio being allocated to Manchukuo (MX) of all places!! The use of this prefix was, however, short-lived because of the defeat of Japan, which had administered Manchukuo (later Manchuria) through a puppet-government. Just a few years after WW2, Monaco commenced to use the M1 prefix, but a whole series of M prefixes were used by military occupation forces such as MB in Austria, MD in several African countries and the Middle East and MP in the Gulf States, just to mention a few. The prefix MD4 was allocated to the "new" post-war DXCC country of British Somaliland. The MD4BPC QSL shown here was sent to well-known Australian DXer, Jim Ruble, VK6RU, in 1948 by a signals unit attached to the British occupying forces stationed at Hargeisa, an important religious and inland trading centre for nomadic tribesmen. This city became the capital of British Somaliland when, following military occupation, the capital was transferred from Berbera on the coast. The reason for the change was that the British wished to indicate a greater involvement in Somali problems.

VQ6AB

The prefix VQ6 (British Somaliland) appeared for the first time in the Official List for ARRL post-war DXCC, published in the February 1947 issue of QST. QSLs bearing either the VQ6 or the MD4 prefix were acceptable for the DXCC award. The VQ6 prefix continued to be used long after the MD4 prefix had expired as military personnel were withdrawn. It remained valid for the DXCC award until Somali became independent on 1st July, 1960.

PSE/TNX QSL Direct <i>George</i> <i>J. F. Higgins</i> EX. VS1BJ		SOMALILAND SCOUTS HARGEISA SOMALILAND PROTECTORATE	
<h1>VQ6AB</h1>			
To Radio <u>VK5RX</u> Confirming QSO on <u>7-3-</u> 19 <u>60</u> at <u>1440</u> GMT		CW Freq: <u>14</u> Mcs Ur Sigs R <u>5</u> S <u>7</u> T <u>9</u> Rx <u>9</u> Lube	
Tx <u>Panda Cub.</u> Input <u>40</u> watts Antenna <u>GSRV</u>		<u>Dang</u>	
73 es Best of Luck			
HARGEISA - BENTWOOD - ESSA			

The QSL resulted from a QSO between the Somaliland Scouts and Old Timer, George Luxon VK5RX, who recently celebrated both his eightieth birthday and his diamond wedding anniversary.

606BW

Although numerical prefixes are quite common today, Somali was one of the sixteen or so countries to use one in 1960, and the first of the prefixes using the numeral 6. By far the most common prefix for Somali amateurs has been 601 but other prefixes have been used. The station 602AB reported in 1961 that British troops were then vacating Somaliland (QST Feb 1961) and 600 DX was reported in net operations in 1980. There was a report also that 6064TI was operating in 1987 as a

special event station, but no details are available. The above prefixes were allocations from the block 60A - 60Z but in 1988 a new prefix block allocation of T5A - T5Z was made. The station T5GG operated (and QSL'd) early that year. The QTH of the 606BW was Chisimaia (more usually spelt Kisimayo or Kismaaya) a town lying by the Indian Ocean in the far southern part of Somalia, just near the Kenyan border. With Soviet assistance in the mid 1960s, it became a naval port, but it has a history as an Arabian and Persian trading post dating back to the eighth century. The QSL was a confirmation of a QSO by the writer when operating from Norfolk Island in 1965 as VK9TL. Next month: Italian Somaliland.

If you like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated, but we espe-

cially need commemorative QSLs, special event stations QSLs, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3199, or phone (059) 643721 for card pick-up or consignment arrangements for large quantities of cards.

Thanks

The WIA would like to thank the following for the kind donation of QSL cards (Supplementary List):

Jim VK1JL (ex VK3AST)
 Arthur VK2AV, Peter VK2FWI (ex VK8DN/MM), Ray VK3RF, John VK3AJT, Moorabbin & District ARC, VK3APC, Brian VK4LV, Greg WBØRTK

CHISIMAIO, REPUBLIC OF SOMALIA EAST AFRICA

606BW

1/19/83 TL

CONFIRMS QSO WITH

RADIO	DATE	GMT	RS	MC	2 WAY
VK9TL	25 JAN 1965	2040	449	14	CW

XMTX — 3252-30L

RECR — 7552A

ANT — T14

QSL MANAGER — W4HKJ

WE

TX * KEN

73 de
BEE WALTON
K4JLD

TX QSO - GSL

Be

Also our thanks to the friends and families of the following "silent keys" (Supplementary List): Des Butler VK1DK, Roy Jonasson VK4NE, Cliff Trail VK3AIT, Bob Grundy VK5BG, Eric Trebilcock BERS195, Ron Gut-tormsen VK4RL

DX QSL Contributors' Ladder

(See "Amateur Radio" March 1989, page 55 for details.)

Contributions (Supplementary List):
Brian VK4LV: Prefixes: VY3, T42
(Cuba) 429, FF2, RG4, NH8, EM6, N16, RI0.
Special Call: G4HMS

Lindsay VK6GZ: Prefixes FT5 (Amster-dam Is), VU4 (Andaman Is), DH6. Special Calls: VK2RAS/5, AX51TU, GB2PYE.

Vic VK5AGX: Prefixes GB75, IQ1, CN9, WW7, FM5. Special Calls: W23OG, OK5CSR, 8J1HAM

Current State of the Ladder

(10 points and above)

Robin	VK6LK	141
Henry	VK3AHQ	91
Chas	VK4UC	58
Eddie	VK8XX	52
Vic	VK5AGX	42
Brian	VK4LV	28
Barry	VK3XV	26
Barry	VK5BS	23
Keith	VK4KS	11
Lindsay	VK5GZ	11
Steve	VK3OT	10

Congratulations

A very find effort. Can we get a few more top DXers to part with a few QSLs?

Starting from January 1990, we will be starting a NEW contributors' ladder. Same scoring (see "AR" March 1989, page 55) except that a "new country" to our collection will count 20 points.

CLUB CORNER

VK4 Disabled Persons' Radio Club News

A classic example of the spirit of amateur radio was displayed by Tony Venables VK2KCK on a recent visit to his future in-laws in Toowoomba.

On hearing of my novice interest in the service, which included a secret hope of some day working "Wheelchair Mobile", he gladly gave a day of his holiday to shop around for rubber duckies and 5/8 vertical whips, mag-netic bases, mounts and screws.

After much soldering, head scratching, mumbling and animated conversation, we finally made a VHF contact with Dugald Johnston VK4EKA via the Arch Marshall memorial repeater VK4RDD on Mt Lofty in Toowoomba.

The 5/8 vertical stood in the middle of the bedroom, the steel reinforcing in the concrete floor making an adequate ground plane. The 221A nestled on a strut right beside the left elbow-rest on FRED - my electric wheelchair - the batteries of which provided a good power supply.

He finally had everything tidied up by around 8 pm., and went home to a very tolerant fiancée. Surely this Good Samaritan act exemplifies amateurism in the true Spirit of Christmas. Keep your ears open for VK4NYE "Wheelchair Mobile - WM??"

The club wishes all amateurs a safe, re-warding Christmas and an enlightening 1990. We'd especially like to send greetings to all who have supported the club, either on our net or by some other means.

We'd particularly like to extend Yuletide greetings to the DX operators such as Bill Christie VK6NWD who, though having to compete with shocking QRN at times, listens in regularly and has a QSO when possible, and also Bernie Kellow VK4PAE when commitments allow.

We hope other regulars will call in to our 50 metre net around Christmas, and join with us in the spirit of the season.

Club nets are held every Friday night at 0900 UTC on 3.590 MHz. Club call is VK4BTB. Station Manager Roley Norgaard VK4AOR (076) 967587 or Graeme Whitehead VK4NE (076) 308323.

Have you
advised DoTC of your
new address?

New International Standards of Voltage & Resistance

As from 0001 UTC on January 1, 1990, the values of the standard Volt and standard Ohm will change. The Comité Consultatif d'Electricité of the Comité International des Poids et Mesures decided last year to establish new international reference standards of voltage and resistance. These would be based on the Josephson effect and the quantum Hall effect, respectively.

However don't rush to adjust your multimeter, or replace resistors in a power supply, because the new international standards will differ little from the four separate standards currently held in laboratories throughout the world. The biggest change in adopting the laboratory reference standards when the international standard comes into being will occur in the United States. The USA National Bureau of Standards will increase the US representation of the Volt by about 9.26 parts per million (ppm) and its value of the Ohm by 1.69 ppm.

EDUCATION NOTES

BRENDA EDMONDS VK3KT
PO Box 565 Mt WAVERLEY 3149

Getting the Message Across

A few recent events have illustrated the difficulties of ensuring that information reaches its destination in its original form. There seems to be little excuse for the changes and losses that occur when information is passed, but all too often, the message fails to reach some of the intended recipients, or arrives in a form very different from the original.

Sometimes we can only blame Murphy, but often problems can be traced to lack of precise instructions, or inattention on the part of the receiver, sender or relay.

If I can use "Education" in the broadest sense, there is a vast amount of educating done on the amateur bands. This ranges from the organised discussion nets, through the requests for information so frequently heard on repeaters, to the dissemination of everyday information about the hobby or events related to it.

One of our main problems is how to ensure that amateurs are in fact informed about the activities of the Institute, clubs or other groups. The main media are, of course, this journal

and the Divisional broadcasts, but not all members avail themselves of these services, and so messages that originate in these official sources are frequently garbled as they are passed on, eventually being received third, fourth or fifth hand, often hardly recognisable.

Those who do read or listen frequently do not register the information at the time. We have all heard a discussion on a repeater concerning a forthcoming event, and noted how little of the information from the previous week's broadcast has been absorbed. (Please note, this is not intended as criticism - I know how easy it is to miss or forget some of the information.)

Can we then ensure that all members are kept informed? What information is necessary? How can it be published?

After a recent WICEN exercise, it was noted that some amateurs had not been made aware that "their" repeater was to be used for WICEN traffic. Most operators accept such usage, and willingly move off if requested to do so, but perhaps in such matters we should be looking at the publicity value of keeping the whole fraternity informed of the activities of small groups. It is very easy to assume that everyone is familiar with a plan or a topic that

for us is an everyday matter.

The Institute has frequently been charged with being a secretive body. Members claim the right to be notified of activities of both Divisions and Executive, but in many instances those members do not equally accept the responsibility of receiving, storing and acting upon the information that is disseminated. Similarly, many decline to contribute to discussions or data collection even when it is specifically requested. Information flow in a body such as the WIA must be in two directions, - in from the members as well as out to them, if the system is to be at its most efficient.

As an example, I have heard very little so far from groups intending to run examinations.

I have not discussed here the problems of communicating with and informing non-members where the information affects all amateurs. An example of this is the WARC conference that is now approaching.

Members will receive regular bulletins on matters relating to this major event in the radio world, and will be asked to contribute in a number of ways, but any benefits from the conference will be enjoyed by all amateurs, not just WIA members. Here is one area where members can help to "educate" non-members on an individual basis, as there do seem to be any formal channels to be used.

My best wishes for the festive season to all my readers.

ar

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

1990 Fees

The Divisional component for Full Members has been determined by Council at the October meeting as \$10. The Federal/AR component for 1990 is \$49. The VK2 fee for 1990 for renewal or new member is \$59. Full details of all VK2 fees will be given on the broadcasts and in Jan AR.

Alinco Hand-Helds

The VK2 Division has obtained a small quantity of DJ-100T 2 metre hand-helds. These have additional features to the previous offer. Details are available from the office. The cost is \$375.00 plus \$7.50 pack and post. Include a current AR label with orders. This offer is available only to members.

Divisional Broadcasts

The last transmission for the year will be on the 17th December. The first for 1990 will be Sunday the 14th January...The first test transmission on 30 metres took place on the 22nd October. It was a time of high solar disturbance. The following Sunday, conditions were much better. Frequency - approx 10.125 MHz. 100 watt pep USB into a dipole at 12 metres, with the main lobes along the NSW coast...The 23 cm repeater was commissioned on Sunday the 12th November at Dural. The equipment was a donation from Dick Smith Electronics. A small microwave field day was held at Dural to mark the event...

Games 89

A Games and Hobby expo was held at the Royal Sydney Showgrounds from the 10th to the 12th November. The VK2 Division, together with Sydney Clubs and the specialist groups, provided an extensive display...The

VK2 Division featured in an article in the Sydney Morning Herald's "GUIDE" on Monday 30th October...

Divisional Office

A reminder that the latest Australian Callbook is available from the office at a price to members of \$8.50 plus pack and post of \$1.50 (Total \$10). Stocks are limited, so don't delay. If you require a 1990 edition of either the International or USA callbook, place your enquiry with the office. They would be about \$50 each...The office will close for the Christmas break in the week before, and reopen in January. Details as usual via the broadcast, or on the telephone news headlines on (02)6511489...The Parramatta office now has FAX facilities. Members wishing to use this mode should check availability with the office first by phone on (02)6892417.

Trial Exam

The Division conducted a trial exam at

Parramatta on Sunday the 29th October when 21 persons attempted 63 papers. They were hard papers. Unrestricted Theory - 15 attempted, 4 passed. Novice Theory - 13 attempted, 5 passed. Regulations - 14 attempted, 13 passed. Morse Code. Novice - 10 attempted, 4 passed; Unrestricted 10 wpm - 8 attempted, 3 passed. If clubs would like to obtain the trial papers, would they contact Terry Ryeland VK2UX, Education Liaison Officer, via the Divisional office. If any member would like a trial paper, contact the office for details.

WICEN (NSW) Inc

The date for the 1990 Hawkesbury Outward Bound Canoe Classic is Saturday the 4th November 1990. WICEN membership application forms may be obtained from the Divisional office.

New Members

A warm welcome is extended to the following who were in the October intake.

W D Brack VK2XPL, Wiley Park, R G Brade VK2GAL, Riverwood, H C Deverell ZL1TFK, Dubbo, W L Dodd Assoc Wentworthville, A J Fisher VK2AAF Beecroft, P C Goldstone VK2APS Bandora Point, A Hossaini Assoc St Leonards, A Jo VK2GAH Beverly Hills, P J Maunsell VK2GAG Bradbury, C C Maile VK2MGU Broadway, T H Truong Assoc Bonnyrigg F Weber VK2FZI Batemans Bay, P C Wohlhagen VK2PSW Albury.

VK3 NOTES

JIM LINTON VK3PC

WIA Vic Div Subscriptions

A general meeting of the WIA Victorian Division held on 26/10/89 decided the membership subscription levels for 1990. From January 1, 1990, there will be only three subscription levels in all seven WIA divisions. In Victoria they are: Full membership (which includes Associates) \$65. Concessional \$52. And a new membership subscription which does not receive Amateur Radio magazine costing \$39. The Concessional subscription will be automatically granted to all existing pensioner and student grade members. It may also be available at the discretion of the WIA Victorian Division Council to those who are bona fide students, pensioners, or needy members of the Institute. The three subscrip-

tion levels will be increased each year by up to the Consumer Price Index for the preceding period.

The Full membership of \$65 consists of a \$49 Federal Component, a \$16 increase, and it includes a \$2 levy to provide funding for international representation. Your Division opposed the \$16 increase in the Federal Component but a majority vote of all Divisions saw it passed. The Divisional component is \$16 for each FULL member and \$5 in respect of concessional subscription. The Division needs funds to provide membership services. It had absorbed two-thirds of the 1989 increase in the Federal component rise, and all CPI increases. The new subscription levels start on January 1, 1990. The bulk of renewals for about 80 per cent of members occur at this time of the year. Anyone who joins the WIA Victorian Division before the end of 1989 need only pay at the 1989 subscription levels.

WIA Victorian Technical Advisory Committee Meeting

The annual meeting of the Victorian Technical Advisory Committee (VTAC) was held on Saturday, November 4, 1989, resulting in a productive discussion forum. Some 19 people involved in repeater and beacon operation and maintenance from throughout Victoria took part. The meeting was opened by the WIA Victorian Division President, Jim Linton VK3PC, who described those in attendance as being like a "fraternity within a fraternity". He said the efforts of those involved in the running of repeaters and beacons was appreciated and in their own unique way they were putting something back into the hobby of amateur radio. Jim Linton reminded those at the meeting that they were free to make suggestions and recommendations for consideration by the WIA Victorian Division Council. He said the Council is receptive to people's suggestions and had placed on the agenda for the next Council meeting to be held later this month consideration of a report on the VTAC meeting.

There were two resolutions unanimously passed by the VTAC meeting: The first reads: "The Victorian Technical Advisory Committee recommends that for controlling access to cross-band linked repeaters where inverted access by radio amateurs not licensed to operate on that band can occur, the approved access method for suitably qualified amateurs be CTCSS using 123 Hertz."

The second resolution reads: "VTAC further recommends that to overcome interference to mobile receivers from paging transmitters that amateur repeater output transmissions be encoded with 123 Hertz." This

will enable those affected by interference to fit receiver decoders to limit the noise. This system fits well with the concept of CTCSS because combination encoder and decoder devices are available which are stable, and cheap. For those not suffering interference no difference in repeater operation will be noticed.

In another decision taken yesterday it was decided that in future any radio amateur in Victoria could make a written submission for consideration at the annual VTAC meeting. Submissions would be invited in advance of the meeting to be held early next November, and those making submissions would be invited to address the afternoon session of the meeting.

Demonstration Station Being Considered

The Divisional Council is currently investigating all options available regarding the transfer of VK3AOM from the old Science Museum in the city to the new location at Spotswood.

There are many factors to be considered, not the least being our long standing and happy association with the museum, and the desirability to publicise our hobby with the young people of today.

The task is being made more difficult by the fact that the State Government has severely limited funding for the Museum and they are looking to us for considerable financial input.

The shorter hours that the new Science Museum will be open and poorer access to the general public, compared with the old city location, and the resultant cost effectiveness of the venture as a public relations exercise, must be carefully looked at. The possibility of some degree of sponsorship from commercial organisations together with firm commitments from the Museum are all being reviewed.

VK4 NOTES

BILL HORNER VK4MWZ

The festive season is upon us again. With all the regional conferences finished, your council now has to wade through the paperwork. Needless to say, the airline strike hasn't done much for the cause.

With the new year around the corner, all the new fees and WIA plans take effect. No doubt many of you will be due for renewal.

The Dalby 2m repeater should be fully operational soon, if not already.

Seasons greetings to you all, please drive carefully.

See you next year.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

The Old Timers' Lunch

On Oct 31st was held at the Marion Hotel, with over 100 "Old Timers" attending. 18 ladies also attended. From the favourable comments that I heard, I would think that we will probably be going back there next year. 1st Prize in the raffle was won by Lionel Medlen VK5ACW, 2nd Prize was won by Beryl Collins the XYL of Lindsay VK5GZ, and 3rd Prize was won by Wally Mann VK5DF. Our thanks for organising the event goes to George Luxon VK5RX, Ray Deane VK5RK, John Allan VK5UL, and Max Farmer VK5GF.

By the time you are reading this we may have a new, or a reinstated former, ESC Manager. Ian Bedson VK5ZB1 with the help of his fiancée, Janet, and later Tom Sears VK5NTJ, managed to keep the bureau going despite having his house pulled down and rebuilt. But now, Ian has decided that enough is enough, and has let us know that we shall need to look for a replacement for him. We wish Janet and Ian every happiness when they "tie the knot" on New Years day, and our thanks for all their past efforts.

New Address for Publications Officer

John Gardiner wishes to advise that he

now has a mail box no. Orders for publications can be sent to John at PO Box 659 Cowandilla, SA 5033.

Diary Dates

Tues Dec 5th WIA Christmas Social

8.00 pm at Woodville Community Hall, 64c Woodville Rd, Woodville. Bring your partner and a plate of supper.

Tues 23rd Jan 1990

This will be a Buy and Sell meeting, there will be NO MEETING on Jan 30th.

I would like to wish you all a very happy, and safe Christmas and holiday time.

VK6 NOTES

JOHN HOWLETT VK6ATA

Call Book

Copies are now available to members at the WIA meetings price \$8.50. Country members send \$8.50 plus \$1.05 P&P. Clubs ordering 12 copies send \$102 plus \$4.55 P&P and save on postage. The bookshop has a wide range of books available; why not discuss your requirements with John VK6GU or write to PO Box 10, West Perth?

Repeater News

A grant of \$1000 from the WA division to the repeater group, will help get a new re-

peater facility started at the Roly-Stone site. A portable building will replace the existing 6'x5' garden shed, and will house a computer for use as a digi repeater and BBS in the future. The building will be air conditioned, to ensure stability and reliability as more technically advanced equipment is installed. The site will eventually be a control hub, and expand the number of repeaters being linked at present.

This is an exciting project in which to be involved. Contact Trevor VK6MS QTHR, and get in at the start.

Clubs

The WIA is printing some AR promotional pamphlets which will be available soon. Properly distributed, the pamphlets can encourage new recruits to your club and AR. Suggested drop off points include Scout and Guide meetings, Youth and Church clubs, public and school libraries. Shops selling radio parts, CB etc. Contact me on 09/3074407 or write to WIA PO Box 10 West Perth for your initial supply.

Page One

Yes, Fred Page SWL L60854 is certainly number one with the membership sec. Fed up with some peoples attitude, Fred has single handedly started a campaign to recruit members to the WIA, with a great deal of success. If you haven't received a letter from Fred, it's probably because you are doing the right thing.

Council wishes you all "A merry Christmas". But take it easy with the contact cleaner. **ar**

Remember. . .

. . . to leave a

3

**second break
between
overs
when using a
repeater.**

INTRUDER WATCH

GORDON LOVEDAY VK4KAL INTRUDER WATCH CO-ORDINATOR
RUBYVALE QLD 4702

Purpose of IW

Some very interesting reading matter arrived during the week I was preparing these notes. I must thank the President of IARU Dick Baldwin W1RU, for the information.

For all of us, the ability to enjoy amateur radio is a rare privilege, one to be guarded zealously. Obviously, therefore it is up to us to vigorously to report the interference caused to amateur radio stations by stations of other services & countries operating within our allocations. We need ALL kinds of reports, we need reports - we need many of these reports, which simply list the presence of an offending

station. We need reports which go into DETAIL of technical characteristics of an offending station. Whatever your level of operating & technical skill, there is a place in the IARUM Monitoring Service for you. YOUR HELP IS NEEDED NOW. It is a task which brings the participant little glory, BUT the satisfaction of knowing that you are doing something worthwhile. It is a task which results in some frustration, because to effect the removal of an intruding station often takes a great span of time. The primary goal of the IARUMS is the protection of the Amateur Service. Please join "US" in working toward a successful accomplishment of that goal. What better Christmas Spirit could you get. **ar**

IARUMS SUMMARY FOR SEPTEMBER 1989

FREQ	UTC	DATE	Logged	MODE	ID	REMARKS
14000	1220	18/8	1	F1b		M/channel 345 deg E (8HA)
14002	1118	06/9				series of ...etc
14023	0710++	15/8+	23	F1b	UMS	Often hrd 8hrs straight
14024	1225	18/8	1	F1		350 deg E (8HA)
14025	0945	21/8	1	AJ3		Thai fishing boats Darwin har-
14025.5	mni	mni	12	F1b		
14038.5	1059	10/9	1	F1b		RTTY RY's
14040	1200	15/8		mx		330 deg E Asian female voice
14046.5	mni	mni	2	F1b		
14046.5	mni	23/9	4	F1b		Pos 3rd shift mod to 14047.5
14048	1215	18/8	32	A3J		Rad Teleph Chinese accent 315
14055/6	1035	20/9	2		PKJ	Calling CPQ
14065	2215	19/8	1	A3E		345 deg E X mod (8HA)
14067	1329	16/9	1		UCN	
14067	"	"	1	F1b		RTTY RY's
14070	0929	24/9	2	A1a	VBX	VPO de VBX QSV K
14072	1055+	23/9	1	"		tfc out OK R ZGR K &c
14073	0220+	21/9	2		RMWV	UAZK de RMWV QYZ Repeated
14075	1235	15/8	1	A1a	VRQ	350 deg E (8HA)
14076+	0156	23/9	1	F1b		RTTY blanks
"	1015	"		A1a		VQD de CPO
14085	1026	24/9	2	"	NPO	CPQ de NPO QSV K
14087	0200	23/9	1	F1b		RTTY 2kHz shift
14100	0930	"	2	A1a	NZB	ZBK de NZB tfe
14101.8	0949	11/9	1	A7a		
14118.2	1122	06/9	2	A2		LL U60 5 NRT QR74 145T
14119	0845+	24/9	1	A1a	IEKA	de IEKA taking tfe
14119.5	mni	mni	13	F1b		UVCV0?3rd Cyr sh 12 hrs op on air
14123.5+	"	"	20	mni		8hrs op suspect ex EUROPE
14124.6	"	"	19	F1b		Also A3C
14131.2	"	"	4	F1b		F1cw is mxid cypher 6 hrs on air
14139.5	mni	"	7	F1bNN	Not	
14140.5	"	"	12	mx	UMS	200/67 3rd shift 8hrs "
Large amt tfe HS	morse	abt 50wpm			UMS	5 fig/51tr Moscow Nav Radio
14143.5	"	13/9	4	F7b		Callsign clearly observed
14147.5	0945	24/8	2	A1a	OH6J	Blocks 5 fig cypher & carrier
14149	0515	27/9	1	"	RG77	RG777 1924 D BT tfe
14115.5	0822+	mni	4	F1b	RTTY	2kHz shift
14168.5	mni	"	6	F1b	USWZ?	Radio ROSTOV ?? USSR
14170.5	"	"	6	F1b	UMS	ID in cw F1b most used 3rd sh
14183.5/45	0836+	11/9	2	F1cw	RIV???	Also uses military Q
code						
14184.5	mni	mni	5	F1b/A1a	UDT???	uses 200/67 & 3rd reg shift
14199.5	"	"	15	F1b		Also carrier
14200	0900	20/9	2	A1a	VMO	VLQ de VMO tfe out
14200.5	1155	28/8	3	F1b		+ F1cw 400+/hz shift 8 hrs op
14202.5	mni	mni	6	F1b		Russian 1trs Q code used RTTY
14215	1000+	04/9	1	A1a	2UH	FF9 de 2UH tfe out
14226	0555	11/9	1	F1b		RTTY 2 kHz shift
14235.2	mni	mni	4	F1b		Band condx to Europe allow cop
21007	1158	17/8	1	A1a		315 deg Darwin
21031.5	dly mni	mni	31	F1b.A1a	UMS	10hrs dly ID in mcw
21068/9	mni	"	-	R7b		18.5 kHz wide
21072	1130	17/8		A1a		5 ltr groups 315 E Darwin
21073.9	0212	21/9		JM		
21100	0405	"	1	A3J	???	2 way QSO foreign males USB
						NOT amateur
21116	mni	mni	1	A1a	CQ5	
21181.4	0642	28/9	1	F1b		RTTY 1.7 kHz shift
21276	0450+	05/9	2	A1a	JUXK	UVKS de JUXK QSA?
21327	0500+	04/9	3	"	TD9	TJ8 de TD9 also on 21355
28151	0240	06/8	1	A3e		B/caster either JA or China
28574.5	1313	15/9	11	A3e		B/caster European or USSR??
28576.1	1104+	23/9	1	"		USSR B/caster News M & F voices

VK6RO has contacted a Gov Interpretation Service in WA & confirms most CB intrusions are from Thailand using Channelised 28 MHz AM rigs, signs every 10kHz. A total of 3,487 logged this month. It is obvious these rigs are factory made. Can the IARU do anything about it??

Book Review

RON COOK VK3AFW

ANTENNA IMPEDANCE MATCHING by Wilfred N Carron Published by the ARRL

Every radio amateur needs a good antenna. Frequently an antenna, which is desirable in other respects, will present a mismatch to the feedline and the transceiver. A common approach today is to use an ATU to compensate for this. A better solution is to match the antenna before it is connected to the feedline. This book describes how you can do this.

My first impression was that the book was generously illustrated with diagrams and charts, and would be easy to read. This was confirmed as soon as I started to read. Wilf logically works through the background theory, and by the time you have completed the first third of the book, you will know more about practical antenna matching than most professional antenna engineers. The contents of the book are distilled from some 40 years experience in matching antennas for military and civil applications, in many fixed and mobile environments. No more prior knowledge than would be appropriate for a Novice licence holder is necessary to read and learn from this book. Don't worry if you don't know what a Smith chart is; with this book you will soon be using one to solve matching problems.

The majority of the book is devoted to illustrating, by way of worked examples, the application of the theory covered in the earlier part of the book. Both narrow band and broad band matching are covered. Even old hands are likely to learn a trick or two. I was surprised to see that a simple L network can be configured in five different ways to match a dipole.

One day, someone will put the contents of this book onto a computer, but until then you can learn some neat tricks with pencil and paper to match any antenna. Although only HF antennas are covered in the book, the principles can be readily used on any frequency where transmission lines and lumped impedances can be used.

I recommend this book to any radio amateur (or professional) who is serious about achieving the best match at the antenna, rather than at the operating console. Indeed, I liked this book so much I bought my own copy! This book is just one from the extensive range of publications available from WIA Magpubs. The price is \$30 (less 10% for WIA members) from WIA Magpubs. ar

SILENT KEYS

We regret to announce the recent passing of:

Mr Bruce Cross	VK2KBB
Mr Colin Leane	VK2MHS
Mr Rupert Crosby	ex VK3BC
Mr Les Doubleday	VK4LD
Mr WAT Howe	VK5AWH
Mr BW Austin	VK5CA

Colin Leane VK2MHS

Colin was a uniting Church Minister, and came to the Albury Wodonga area some few years ago. He occasionally visited the Twin Cities Radio Club when time permitted, as he was a busy minister in his parish.

This year, he was able to find enough time to attend the AOC classes run for Radio Club by Graeme VK3ZR; recently he became secretary.

He was a jovial guy - full of fun and humor - and was just beginning to really enjoy the benefits of having passed his novice licence in August this year. We heard him mobile and from his home, and he was beginning to become a most active amateur in the border district. It was obvious that he found Amateur Radio to be a good relaxation. He was clearly enjoying the hobby.

He met with a most unfortunate accident, when returning to Albury from Melbourne late at night recently. He fell asleep at the wheel and ran off the road and hit a tree near Euroa on the Hume Highway.

So ended the life of a really great guy, who had helped countless people, and who was a real pun-maker with a great sense of humour.

He used to joke that his callsign meant VK2 "My Holy Son".

His gear will no doubt be treasured by one of his grandchildren, who has shown interest in our hobby.

All the members of the Twin Cities Radio Club will miss him greatly and we pass our condolences to his family.

PETER WOHLHAGEN VK2PSW
SECRETARY

Ex-VK3BC Rupert Crosby

"The Mornington Peninsula area has lost one of its great Amateur Radio identities with the death of Rupert E B Crosby on 21/8/89. The well modulated voice emanating from VK3 Baker Charlie was known to many amateurs, both locally and far afield.

A descendant of the William Crosby family of Hobart shipping fame, Rupert was born in 1917. He attended Melbourne Grammar

school, and commenced work in 1931 as a wireless telegraphist with the PMG.

During the 1939-45 war he served with the Army, firstly as a signals instructor with the 3rd Div Southern Command, then later with the AIF in NT and NG with the rank of Captain.

More recently he worked for the ABC before retiring to Sorrento about 15 years ago. Rupert was first licensed on 6/8/1940. He was a foundation member of the Southern Peninsula Amateur Radio Club, a member of the "Old Timers Club", and almoner with the Sorrento lodge. He ran the 80m "Sparc" net for many years, and assisted with the Masonic net in the period 1981-6.

Rupert suffered a major road accident a few years ago, from which he never fully recovered. He later moved back to Melbourne for a short time, before final admission to Heidelberg Hospital with meningitis. To his wife Irene, we extend our deepest sympathy."

JOE DONALD (VK3AXM)

SOUTHERN PENINSULA AMATEUR
RADIO CLUB

Les Doubleday VK4LD

Les obtained his 2nd Class OCP on 1/6/38 when he then went to sea as a radio officer on various merchant ships, terminating in 1946. He then joined OTC retiring in 1979, during which time he saw service in Sydney, Port Moresby and lastly in Rockhampton. He obtained his Amateur licence in 1947, and mainly used CW mode to communicate with his mates in and around Australia - mostly on the 40m band. Also, he was an accomplished pianist and organist, and used these talents to the benefit of people in old aged persons homes in Rockhampton.

Les was an unassuming type of person, always ready to help anyone with any problems. He continued to do this, until he was restricted by a long and debilitating illness to which he finally succumbed. He is survived by Hilda and four (4) children, Margaret, Helen, Robert and June, and he will be sadly missed by all who knew or had come in contact with him.

MERV DEAKIN VK4DV

William A McDevitt VK4XM

At the grand old age of 84 years, Bill VK4XM joined the SKs on a higher frequency, on 26th May 1989.

Bill was born in the Land of the Long White Cloud, a fact not known to many of his friends and one of his first jobs was that of W/O at sea. He obtained the amateur call ZL1FN, and made many DX QSOs in the 1920s when a CQ was truly "a call into the unknown". After a few years he quit the job of ship's "SPARK" and crossed the Tasman to settle in Australia where, with the sound of morse still ringing in his ears, he eventually took out a VK2 licence.

VK4XM was an electrician by trade - a very competent one who worked on some important projects for large companies, viz BHP in Wollongong and Newcastle, then the Lysaght Group. From 1950 he was employed in Burnells in Nth Queensland where he became well-known to the local amateur group. During the 1960s Bill finally settled in Brisbane to enjoy his retirement.

In the true spirit of amateur camaraderie Bill was always ready to give his time to others, less experienced, who had radio problems. A member of the WIA in his earlier years VK4XM regularly attended meetings. The loss of such a skilled member of the fraternity is always irreplaceable. W A McDevitt is survived by one son, Anthony.

ALAN SHAWSMITH VK4SS
ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION AND SHOULD BE LESS THAN 200 WORDS.

THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

10 Metre Intruders

I wish to raise what I consider to be a very serious matter.

Tuning across the 10 m Band any day between 3.00 pm and 9.00 pm EAST, one finds the band full of intruders.

These intruders are Indonesian nationals using our AMATEUR band for CB operation.

In fact the spectrum from the 27 MHz CB allocation to 28.8 MHz is full of these intruders - there must be thousands of them.

To all intents and purposes 10m is useless for DX into Asia during the above mentioned times. If a clear spot is found your contact is likely to suffer deliberate QRM.

If you call CQ you are likely to be called by an Indonesian pirate (yes they have SSB rigs too!)

To be called by an unlicensed intruder I regard as the ultimate insult. Therefore I hope by now Australian amateurs are aware of this problem.

I hope that action is being or will be taken federal level to obtain some relief in this matter.

At the very least I would hope that the donesation authorities are reminded of their obligations under the ITU agreement and at Australian amateurs are daily being sulted and inconvenienced.

IAN BERWICK VK3ALZ

107 LOONGANA AVE, GLENROY 3046

(Ian's letter was referred to the Federal intruder Watch co-ordinator, VK4KAL, and s response follows. We will also discuss the oblem with DOTC. Ed)

Agree . . .

I quite agree with Ian's concern, it is serious and I don't know what the action will be. In DOTC or ITU or anyone else impose any strictions on these illegal operations? The 3ers ARE NOT all from INDONESIA, I ve reason to believe that THAILAND shares in honour (my informant is one well versed Asian languages). It would also appear at these sets are being manufactured specially for the 10m band, at a spacing of 25 Hz...A3 mode channelized. There are just many transmissions for the sets to be inverted...VK6RO logs over 2,500 CBers each nth from his own QTH...I would estimate 100 each month come to my notice.

If we were fortunate enough to find out who a manufacturer is, and if it happened to be supplier of Amateur Rigs, well just maybe a ycott could be considered. Could Government do anything through DOTC? I mended this matter to Bill VK2COP to see what can "unearth" via David Rankin.

It would appear that many have ignored air leaders in our immediate north. Counes can't win respect by these tactics. Maybe few kilowatts of power would deter m...I've heard a W or two do just that, very ective!

I'm sorry, Bill I've got NO solution to the oblem, I do not know how to get through to se people, any more than I know how to get re observers!

I can only suggest to Ian that he sit on an ruder and make him move first, it does rk some of the time, especially if your tact has more power.

Not having a magic wand, I can only pass my kind regards.

GORDON LOVEDAY VK4KAL

FEDERAL INTRUDER WATCH

CO-ORDINATOR

"AVIEMORE" RUBYVALE 4702

Whingers

This is a response to the discussion point raised by David (VK4BGB) in his letter about whingers in the October issue.

David need not worry about whingers influencing other members by writing to AR. Our editor will censor opinions which might lure members away from the party line. He will also add editorial interjections to the parts of letters actually published and follow up with a persuasive editorial and other advocacy journalism to support executive opinions and edicts.

A threat to resign from the institute as a protest against a federal executive edict is a form of blackmail, but probably justified, because ordinary members of a WIA division have no other form of redress for what they perceive as the wrongs of the federal executive. The executive is not elected by a poll of ordinary members.

The cost of the proposed increase is not the problem David; most members can easily afford that, but the divisions cannot afford to lose members and potential members because the increase does not guarantee better value.

The federal executive is becoming a group of entrenched officials who make decisions at meetings conducted in camera. They stifle debate about those decisions, and label dissenters ill-informed fools or, like David, label them whingers. Such derogatory comment is foolish because it will alienate the really useful members; those who want to exercise their democratic right to participate in the decision making.

The Federal WIA is a private company established in 1972 to sell services to the divisions (see the Memo and Articles of Association). In the meantime the company executive have developed an authoritarian control of the divisions and their members and in their turn are being manipulated by the government bureaucracy to the point of being an arm of that bureaucracy. The exception is the general manager and staff who are genuinely providing service. The cost of the service is of course in the hands of the purveyor. For those interested in regaining member control I suggest winding up the federal company or disbanding the federal company and the divisions and replacing these with a genuinely democratic National Institute. I also suggest the divisions conduct, separately, a postal poll of all members to assess the acceptability of those options.

One final comment which David and other readers might consider. The proposed increase is to cover present fund shortfall which includes the salary of a bargain priced manager. What provision is there for a future in which paid executives will demand their market value?

LINDSAY LAWLESS

Box 112

LAKE ENTRANCE 3909

(Little of what you say actually corresponds with the facts, Lindsay. To take your comments in order:

i. No opinions are censored. They may be abbreviated to save space. Very rarely, if completely incorrect or perhaps libellous, they may be rejected and the writer privately advised why.

ii. "Executive opinions" and "party line" are emotive journalism, implying malfunction where none exists. Executive decisions are in accordance with Divisional viewpoints and reflect authority given by Divisions to the Executive. Sometimes there are misunderstandings, in which case if it has acted against a Divisional intention, Executive is rapidly requested to revise its action. We do not issue edicts!

iii. "Ordinary members" have at least two "forms of redress" against "perceived wrongs". They can write to AR (as you have) or to the Executive, or they can talk to their Federal Councillor (who now meets with Executive four times a year). Resignation achieves nothing.

iv. Speaking as one of Executive's "entrenched officials", I would welcome the opportunity to retire and hand over to a successor. There seems no rush of applicants, either for Executive or the Divisional Councils. Meetings are not "in camera"; "ordinary members" may attend if they wish. Debate is not "stifled". Some people ARE ill-informed, and some ARE whingers. The "democratic right" to participate in decision making implies an obligation to know what you are talking about!

v. "Authoritarian control of the Divisions" is more emotive verbiage. The Divisions control Executive, usually by reasonable discussion. Our relationship with the "government bureaucracy" is two-way, again by reasonable discussion. A "genuinely democratic National Institute" is what we all desire, but in the process of achieving it, let us be careful not to "throw out the baby with the bath-water!" Ed.

Very Trying?

In answer to a members' letter, in the October issue, you mentioned that the WIA had at least tried.

Yes, the WIA is trying all right. Trying hard to commit self-immolation!

Recently, we (in VK3) have seen: 1. The relocation of the rooms from a good, inner-city location to one that is remote from public transport; 2. The long-term closure of the Inwards QSL bureau; and, 3. As if to add insult to injury, a PHENOMENAL increase in membership fees.

The WIA will soon be drawing its members from only the "super-rich".

Please, WIA stop "trying".

TERRY ROBINSON VK3DWZ

21 RUSSELL AVE

WOODEND 3442

(The reasons for your complaint 3 have been covered in some detail, Terry. As for numbers 1 and 2, these are Victorian Divisional decisions. The Division may also respond to your letter. Ed)

The "Quiet" Call Channels

"Call channels" on all amateur bands have been allotted in WIA band Plans for a number of years.

The first allocation I am able to find on 2 metres is in the 1979 Callbook for channel 50 or 146.500 MHz.

There were probably nominated calling frequencies before this time. I would like to hear more of the history of the various call channels.

Until recently the WIA - intended use of these channels was not clearly defined. I quote the General Manager & secretary of the WIA, Bill Roper, VK3ARZ - P9 4 March AR "the CALLING CHANNEL of 146.500 MHz, or the old channel 50 is intended to be just that, a CALLING CHANNEL, and not a frequency for general conversation."

This intention has been announced on the Sunday WIA broadcast also.

A few amateur stations still continue to chat for lengthy periods on this Primary call channel (and other call channels on other bands).

I guess they may be uninformed in the recommended WIA Practice of making contact on a CALL CHANNEL then moving to a recognized simplex channel (or repeater) not in use. Eg 146.425 : 146.450 : 146.475 : 146.525 : 146.655 etc.

Check the Band Plans for the Amateur Service on page 24 of February 1989 issue of Amateur Radio for the preferred frequencies for your operation.

If there is some technical reason that you have to hold a conversation on the call channel I would like to discuss it - just give me a call - on 146.500 and we will find somewhere to QSY.

If you do not wish to use the system of "Gentlepersons agreement" on which the band Plan is based, consider the following:

My fellow radio operator and I arrange to make contact on Call Channel 6500. He is using a 2 watt hand held. I have a mobile station - 10 watts. We are about to call and two base stations make contact on 6500 and carry out a long over QSO. I attempt to contact my fellow radio operator during the miniature break between the base stations' long overs. The base stations do not seem to hear our calls and continue on. We cannot hear each other but we are in contact range if the call channel were QUIET.

Next - Two "country" radio operators having a QSO on 6500, one base, the other mobile 50 km, from my base station. The base is S3 and the mobile "in the noise" to me. I wish to contact my fellow operator who is mobile 20 km away. He would be S1 to me normally from his position. We are not able to call without causing interference to the incorrect operators or waiting perhaps an hour for a QUIET call channel.

Lastly - DX on the SSB call channel 144.100. A base station close to mine puts 100 watts through two co-phased 13 element yagis up 15 metres. I have a 10 watt transmitter through one 11 element yagi up 10 metres. Guess what - the neighbour bags a contact on 144.100 from VK6 and does not attempt to QSY. If there were other DX I have no possibility of making a contact through the QRM unless the call channel is QUIET.

I hope through this article our fellow operators can see why we should follow the Band Plan which has been carefully devised over a long time and continues to be updated by a dedicated and experienced group of people elected to the task.

JOHN SMEDLEY VK5AJS
4 BENTLEY AVE
FULHAM GARDENS
5024

Use of Q Code

I refer to recent correspondence on the above subject from B Bernays VK6CH and KWH Perry VK5AFF. Both these gentlemen suffer from a lack of knowledge of the subject and an apparent lack of a sense of humour. To set the record straight, the following facts are presented. The Central Highlands ARC has 31 members from VKs 2, 3, 4 and 7. We pay no annual subscription, but raise enough funds to pay such expenses as the annual licence fee for the club station call by fining OUR members for sundry misdemeanours on air. No other amateur is affected by our club rules. Our authority for the banning of Q Code on phone is the ARRL Operating Manual 1980, page 31, which states "Q-signals should not be used on phone".

Finally, I can assure both gentlemen that they would be most welcome to our state at any time, and that they would receive the friendship and hospitality which is always offered to visiting amateurs.

BOB JACKSON VK7NBF
VICE-PRESIDENT CHARC
FALMOUTH
7215

UTC Time?

Let us have a policy of using UTC time throughout AR - our magazine is international, so let us forget local time. A stupid example: P35 AR Sept 1989 column 1 JOTA: When! Local time 0001 hours. (Local time where??) (At any time zone worldwide - Ed). Further down the article - column 3 national broadcast 0400Z. (Still at the war!)

In WIA Directory P3 AR Sept 1989, you make it hard for interstate amateurs. (UTC is impractical for broadcast times due to daylight saving changes Bob - Ed).

AR seems to have forgotten the experimental side of our hobby - circuits suitable for beginners - I don't mean only novices.

BOB NEVILLE VK4NFE
124 ROSCOMMON RD
BOONDAL 4034

Book Availability

Following my review of the book "Secret Warfare", I received a few phone calls from amateurs unable to obtain the book. They were told it was not available etc. This is not so. A workmate had a copy sent to him from Britain about the time the article appeared in AR. I checked with the bookshop I obtained my copy from: Irene's Bookshop, 97 Bridge Street, Benalla, 3672, telephone 057 62 4304, and found that it is, indeed, still available.

It is likely to be obtainable through Angus & Robertson. If you are unable to obtain it through your own bookshop, Irene's Bookshop would be prepared to assist any who do want to obtain this book.

RODNEY CHAMPNESS VK3UG
2/95 BENALLA STREET
BENALLA 3672

Polarised Plugs

Further letters on this topic have been received from VK3YNB, the original author VK2BIN, and VK5RG. It was stated last month that this correspondence was now closed, and the letters from 3YNB and 2BIN do not introduce any new information to the discussion. We thank them, nevertheless, for their contributions.

However, the letter from VK5RG does make several points which have not been clarified before, and refers in some detail to the SAA Wiring Rules. We concede therefore that it should be published as the "last word" on the whole confusing situation. Ed.

Power Safety Article

I believe the letters "Over to you" in the October, 1988 issue, as, well as the Editor's apology for the p31, September article, have confirmed that most amateurs are sufficiently alert with respect to the dangers of AC mains and GPO configurations.

I make a few final observations on the correspondence:

A fuse or circuit breaker is installed in a circuit primarily to protect the cable - ie. from overheating and insulation flow caused by excessive current. The mistaken belief that it protects the equipment, regrettably continues, although equipment protection is one consideration.

Australian Standard AS 3000 - 1986 "SAA Wiring Rules", Section 7 "Extra Low Voltage Installations" lays down requirements for up to 40V AC or 145V DC installations. An "installation" is defined in paragraph 0.5.5a, page 19, and as the ELV Section in most cases is a "portion of an installation", our wiring on our DC 12V circuits must comply with Section 7.

Paragraph 7.14 addresses plugs and socket-outlets and specifically where in the same premises there is an installation of a greater voltage, the ELV plugs and sockets must, in 7.14 (a) have voltages marked, and 7.14 (b) use plugs/sockets that are different from those used on the higher voltage.

The recommended plug/socket types are

mentioned by other correspondents, and must comply with AS 3112.

The editor's comment about use of the 240V three pin flat plug being legal for 12V is subject to interpretation, but in my opinion contravenes AS 3000 1986, Paragraph 7.14 (b). Its use invites conjecture on validity of insurance, manslaughter charges, as well as the already mentioned damage to amateur equipment.

I might draw readers' attention to Paragraph 4.27 concerning Batteries — numerous

rules are broken daily by amateurs, however be warned of flying red-hot copper if you use a rewirable fuse. Paragraph 4.27.4.1 requires the use of circuit breakers or enclosed (inferred) fuses at the Battery Terminals. Suitable 20-30 Amp, Automotive CB's are available from any auto supply outlet, are self resetting, and a must where battery installation are used.

ROB GURR VK5RG

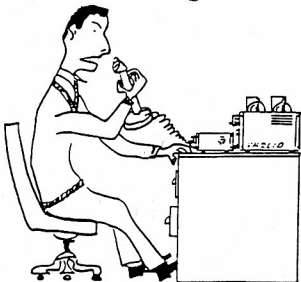
PO Box 35 DAW PARK 5041

ar



Rowland Bruce VK5OU (L) presents the Ross Hull Memorial Trophy to 1989 winner Trevor Niven VK5NC. Photo Ian Hunt VK5QX

"I always operate on beacon frequencies, OM . . .
... lots less QRM!!"



Bill Martin K2COP

LOG BOOK COVERS

Would make ideal
CHRISTMAS GIFT

Dark blue leatherette,
with gold lettering on
front cover - perfect
protection for your Log
Book (vertical A4 Type
size)

Available at only \$17.00
each, including packing &
postage

Please write to
Magpups,

P.O. Box 300,
Caulfield South 3162 Victoria

HAMADS

TRADE ADS

AMIDON FERROMAGNETIC CORES: For all receiver and transmitter applications. Send large SASE for data and price to RJ & US Imports, Box 157, Mortdale NSW 2223. (No enquiries at office please...11 Macken St, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove; Webb Electronics, Albury; Electronic Components ACT; Truscott Electronics Vic; Willis Trading Co WA; Associated TV Service Hobart.

SATFAX: weather satellite picture receiving program for IBM XT/AT, displays in 64 colours. Needs EGA colour monitor & card. AM demodulator & ADC interface. \$45 + \$3 postage***
RADFA2: HF weather fax, Morse & RTTY receiving program for IBM XT/AT. Needs CGA, SSBHF, FSK/Tone decoder. Also "RH2HERC" & "RF2EGA", same as RADFA2 but suitable for Hercules & EGA cards respectively. \$35 + \$3 postage*** All programs are on 5.25" 360K floppy + full documentation. ONLY from M.Delahunty, 42 Villiers St, New Farm 4005 QLD Ph (07)3582785

AMATEURS! — receive FAX/RTTY/CW using your computer and famous Listening Post Project. Software for Apple II, Macroebe, C64/128 (no CW). Commodore program is new, more features! All print out using common dot-matrix printers. Apple & Commodore put fax on-screen. Full documentation. \$32, post free, anywhere in VK. FT Promotions, PO Box 547 Rozelle NSW 2039. Ph: (02) 818 4838. Fax: (02) 818 2949

FOR SALE - ACT

YAESU FT707 transceiver with digital VFO, ATU & mobile mount. Gear in excellent condition is complete with all handbooks and workshop manual \$800. Swan 100mX mobile transceiver with matching power supply. Unit is in excellent condition and is complete with owner's handbook \$600. Both units are working 100% and have no known faults. Phone Richard VK1UE (062)581228 or QTHR.

FOR SALE - NSW

DECEASED ESTATE of VK2KBB. Bruce Cross 22 Crescent Ave, Taree. Telephone (065)522692

Yaesu V/UHF FT-726R fitted with 70cm & satellite units. Realistic offer. Yaesu FT-270 RH with external speaker & voice unit \$650. Tokyo Hy-power amplifier HL-1207 new \$500. Tokyo Hy-power amplifier HL-180V as new \$400. Tokyo Hy-power amplifier HL-85V \$250. FT 101 with antenna tuner \$525. Kemptor rotator \$200. 2 metre satellite 20 element antenna with mast-head amplifier \$400. Skeleton slot 5x5 \$200. Midland 10M2 with CB crystals \$100. Power supply 12V & 5V \$50. DX 160 \$80. Regulated power supply \$50. Preampifier \$35. Amplified Realistic speaker \$30. Plus various other antennas etc.

MARCONI TF801A/1 sig generator 10-310 MHz \$150. USG20D sig generator 120 kHz - 500 MHz \$50. University 3 inch CRO \$75. Palec VT (probe) multimeter \$35. VK2ETH QTHR. (065)822928.

Kenwood TS430S TCVR with CW filter. As new little use. Mic manual orig packing \$1,100. Kenwood PS430 power supply \$350. VK2ETH QTHR (065)822928.

Latest model kits for electronic IAMBIC keyers from California. Call VK2AXR, Al in Sydney (02)4776275 after 6pm.

ALPHA 374 HF amplifier grounded grids for three 8874 tubes. Manual or preset band tuning networks - \$1650. (02)3492636.

Bargain. TS930S Kenwood. Recently fully serviced by Kenwood. Mint condx. Manual, original carton. Air test available. QTHR Harry VK2DA. \$2,000 inc Amtrs only. (02)941039 or (02) 949 1195 PM.

HF linear Elmac 4CX1000A vacuum capacitors B & W tank circuit C core transformers 100% duty cycle at legal limit. VK2DTR (02)9183835.

EIMAC 4CX1000A tube socket & chimney, silver-plated tank circuit, HF Millen band switch, Vac-caps 1000 pF 10,000V ceramic-1000 pF 5000V glass-10 pF filter 5000V (02)9183835.

TS820S handbook, m/c, \$450. ATU new \$175. 2 mtr transceiver, P/S etc \$100. 14AVQ vert ant \$60. John QTHR (02) 638 4191 VK2ANX.

SIEMENS model 100 and model 15 type teleprinters both with manual and circuits. Model 15 has spare printing hammer \$25 each. 240V to 115V stepdown transformer suitable for such teleprinters \$50. Phone John VK2CJV (02)8095024 QTHR.

FOR SALE - VIC

ICOM 735 HF transceiver 6 months old HK electronic keyer, spare power lead, mobile head-set mint cond \$1600. Kenwood VHF transceiver TM2550A 45 Watts 23 memory has DCL channel link fitted mint cond \$500 both with manuals & orig boxes. (03)7269922 aft 5 pm.

MICROBEE 32k RAM computer, fitted with internal ROMPAK. Contains word processor, Z80 editor/assembler, Logo, spreadsheet, EPROM programmer & RTTY programs in EPROM. Microbee Technical Manual and Engineering Notebook, much other information. RTTY modem (XR2206/XR2211 ICs) with connecting cables. ETI-668 Microbee EPROM programmer \$350. Icom IC225 2m FM transceiver, very good condition, with bracket, mic and hand-book. Yaesu FP-2 base PSU/SPKR. Homebrew external programmer/digital display/priority channel monitor, 1/4W ground plane antenna \$250. DSE 80m HF SSB transceiver, with bracket, mic and handbook, 15m conver-

sion kit. Regulated mains PSU in matching case. Low-pass filter. 3-way antenna switch \$350. Bob VK3BMA QTHR. (03)4042241 AH. (03)6573708 BH.

ICOM IC2A 2 metre hand-held c/w original packaging, leather case and charger. Nicad batteries recently replaced \$190. Peter Hamilton VK3XFO QTHR (03)7231694 AH.

ZENITH radio frequency meter \$30. Hansen SWR power meter \$50. Roller inductor with counter \$50. Kingsley receivers four off one with coil boxes power supply \$40 lot. Heathkit comm receiver xtal filter plus manual \$40. VK3ABW. Phone: (03) 568 7428.

KENPRO 2000 heavy duty rotator \$450. ONO Ted VK3TG 14 Nottingham St, Port Arlington 3223 (052)593225.

AWA VHF FM all valve xmitter 50 Watts output 10 sets of xtal freqs RGV, RML, RBA, RMM (old) RMM (new), RWZ, RGL, RCV, 40, 50 plus room for more. Wall mounted frame all in VGC - also spare valves ideal base stn. Make me a fair offer. Arthur VK3CUA QTHR - (054)437425.

STC31 VHF FM hybrid txmitter has 3 xtal freqs RML...ch40, ch50. Output power 15 Watts...spare valves. With circuit \$60. Arthur VK3CUA - QTHR (054)437425.

2 M FM 8 element mono band cubical quad all aluminum structure one fibre glass spreader for each loop. 9 mm alum tubing (loops) 14 ft alum boom - approx - gain 13.5 DBI easy to assemble and to tune (no drill holes) \$120 - ONO - VGC. Arthur VK3CUA - QTHR - (054)437425.

FT230R 2m FM transceiver to swap for 10 m mobile SSB transceiver Stan VK3BNJ (03)7436708.

KENWOOD TS-440S transceiver VGC plus full service manual \$1,750. Kenwood TL-922 linear amp mint cond \$2,500 ONO. Welz RS-3050 DC power supply 30A peak, variable voltage \$450 ONO. Daiwa CNW518 2kW ATU \$450. Nally tower 14.5 m foundation pipe \$1,250 ONO. Kenpro KR-2000 RC 12 mths old cost \$950 sell \$750 ONO. Kenwood phone patch controller & line isolation unit WIA VK2D inspected and Telecom approved \$100. Several 20 plus metres of R8GU & RG213U \$45 each. Arlec 18A surge battery charger \$140. Maldol 2 kW 1/1 balun \$35. MFJ 6 pos coaxial switch box suit HF & VHF 30. CW key on base \$40. Heathkit kW Dummy load \$50. EM5 multiband HF mobile whip with spring loaded pipe mast which mounts on towbar \$95. 10 m mobile whip \$35. 2x8 el 2m phased beams some elements need repair \$85. 10 el SSB 2m beam some elements need repair \$50. 6 m length 49 mm diam 4 mm thick high tensile scaffolding aluminium \$80. Chirmside multi-band vertical base ant \$60. Various other assorted bits & pieces for sale eg C42 FM transceiver & matching tuner \$45. Please enquire (03)359.2903. Paul VK3CGR.

KEN KP202 2m hand-held 6 ass channels C/W nicads and drop-in charger GC \$120. STC 151 B 25 Watt mobile on 2m, handbook GC \$65. QTHR (054)286309. VK3ZJS.

ANTENNA w wulf duo band Yagi ten and fifteen metres. Assembly and tuning details. Good condition \$140. VK3GRB QTHR (03)5921944.

YAESU FL2100B linear mint condition in carton \$900. Ken VK3ASN QTHR (03)8425905.

FOR SALE - QLD

YAESU FT101E VGC in orig box with manual, unused spare finals and spare driver \$450. Kenwood AT130 ATU with mobile mount \$125. Graham VK4GD QTHR (07)3780798.

MICROWAVE MODULES MML 432/50 70cm linear amplifier 50 Watts \$350. Ampere APB-82A 2 metre linear amplifier 80 Watts \$250. Ross VK4IY QTHR (075)651445.

HIGH POWER military amp SL42, 1kW CW continuous, 23-60 MHz. 7 metal boxes: transformer, rectifier, filter, PA, SW indicator, C42/C45 AC PSU, Yagi. Rack assembly, all cables, manual. Missing L348/U2 control unit. Weight approx 500 kg. Offers to VK4APD QTHR. (07)3973751 evenings.

JCOM IC505. 50 MHz transceiver with FM adaptor base power supply and manuals \$400. Kenwood TM2570A 144 MHz transceiver with base AC supply and manuals \$500. Ken VK4BX QTHR (070)913040.

FOR SALE - SA

TELCON semi air spaced twin coax 2kW to 2m, transmitting tubes 4-65A; 4E27(813) Grundig reel-to-reel recorder two sets tubes KW2000; Portable Diathermy 600 watts 7 metres; Post-war receiving tubes new ribbon micro - VK5LC QTHR (08)2716841.

FOR SALE - TAS

NEW TUBES 2C39BA QCE06/40 Q83/300 \$40 ea. QCE03/20 QE05/40F 6883 \$20 ea. QCE03/12 QCE02/5 QCE04/5 \$10 ea. QCE03/10 5763 12BY7A E88CC E180F \$5 ea. Lionel VK7ZLB QTHR (003)272799.

SWAP - ACT

NIKON camera system VGC. Incl wide range of accessories, for crankup tillover tower and/or mobile rig recent vintage HF/VHF similar value VK1RJ QTHR (062)885394.

WANTED - ACT

YAESU mobile antenna gutter-grip type. Only need RSM-2 base, lead and 2m antenna. Contact Richard VK1UE (062)581228 or QTHR.

WANTED - NSW

FTV107R xvertr, SP107P spkr, FP107E pwr supp, all ivory faced. EAT2000 ATU also wanted Ken VK2LT (02)5195669.

Trapped vertical HF also 2m amp. (066)723625 A/H VK2AVS.

Butternut HF6V antenna in very good condition 10-15-20-30-40 and 80 mtrs. Phone or write to Steve (02) 6541809. VK2PS QTHR.

WANTED - VIC

TH3-JR triband antenna or similar - Leo VK3BSX (03)5983115. QTHR.

KENWOOD SWZ00 coupler type SWC1 1.8-150 MHz. (03)7837717 QTHR. VK3ZLA

RSL14 14 MHz resonant whip to suit Yaesu RS series mobile antenna. Stan VK3BNJ (03)7436708 QTHR

ACCESSORY for Yaesu FT901 or FT902 transceiver like FV901D7, YO901, speaker. Fred Kent (058)646287 QTHR (058)622545 FAX.

PLEASE don't throw out those QSL cards. Please contact Ken VK3TL on (059)643721 or PO 1 Seville 3139. WIA QSL collection hon curator.

BSR tone arm assy required turn overhead STD to LP to suit Kreisler model 11-37 table radio gram. Also photostat of circuit could be appreciated. Neil VK3YLW (03)5804312. QTHR

FT101ZD Yaesu in GC will pay good price for good unit Damian VK3EHP (053)524183 aft 6pm not QTHR.

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non-members. Please enclosed a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

- ☐ Miscellaneous
☐ For Sale
☐ Wanted

Name:

Call Sign:

Address:

*QTHR means address is correct as set out in the WIA current Call Book.

*A courtesy note will be forwarded to acknowledge that the ad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows: \$22.50 for four lines, plus \$2.00 per line (or part thereof) Minimum charge — \$22.50 pre-payable.

State:

WANTED - QLD

BUY or borrow manual Hygain 402BA 40 metre beam so I can convert old TH6DX beam to it VK4EF 97 Jubilee Tce Bardon Brisbane 4065 (07)3661803 AH.

KENWOOD speaker SP930. Graham VK4GD QTHR (07)3780798.

ROTATOR suit Yagi 3 element beam must be good condition Len VK4BIH QTHR (07)3963650.

FOR EDDYSTONE RX valves UAF42, UCH42, UL41. Can anyone help please? Will pay reasonable price, postage etc John VK4WLX QTHR (07)947443.

DESPERATELY need copy of EMI record or tape Joe Loss orchestra carnival SCXP 7785 if tape best quality material please. Allan VK4FBB QTHR (07)921948.

WANTED - SA

SIX METER conversion details for Bushranger CB or similar unit any help appreciated. Alan VK5BWG PO Box 1337, Stirling North, 5710, Sth Aust.

WANTED - TAS

AUSTRALIAN official radio service manuals vols 1, 6, 9, 12, 13 & 14 R&H Jan 45, Feb 45, Feb 46, Mar 48, Dec 48, May 49, Feb 51, Apr 51, Mar 52, Dec 52, May 58, Jan 65. Lionel VK7ZLB QTHR (003)272799.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly**.

VICTORIAN CONSUMER AFFAIRS ACT.

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the boxholder or seller of the goods.

TYPESETTING : Redfords Media
25 Glenferrie Rd
Malvern 3144
Tel: (03) 500 0377

PRINTING: Industrial Printing
Richmond

MAIL DISTRIBUTION: Polk Mailing Co.
PO Box 140,
Collingwood,
Vic. 3066
Tel: (03) 417 5161

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

ADVERTISER'S INDEX

ATN Antennas	45
Callbook	13
Dick Smith Electronics ..	22,23,24,25
Electronics Australia	IBC
Electronics Today International ..	29
Emtronics	7, 9
Ian J Truscott's Electronic World	35
Icom Australia	OBC, 32,33
Kenwood Electronics Aust. ..	IFC, 17
Magpubs	27
Q D Electronics	31
Stewart Electronic Components ..	31
VHF Magazine	45
Vitcall	20
WIA NSW Division	37
TRADE ADS	
RJ & US Imports	62
M Delahunty	62
FT Promotions	62

HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms:

Call Sign (if applicable):

Address:

State and Postcode:

Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

Remember Jim Rowe, VK2ZLO? Jim used to be Technical Editor, and then Editor – back in the late 1960's and 1970's. You may recall some of the amateur radio and test equipment projects he developed, which proved to be extremely popular. Well, Jim is back at the helm of the magazine, and has been busy giving it a new lease of life.

You'll now find lots of new 'departments' in the magazine, including Solid State Update (with news of new semiconductor devices), Silicon Valley Update (news from the USA) and What's New in Entertainment Electronics. Plus all of your old favourites like Forum, The Serviceman, Circuit and Design Ideas and so on. And of course plenty of 'meaty' technical articles and construction projects.

What about *amateur radio* projects? Well, there still aren't too many, at present – Jim Rowe's been a bit too busy! But he's very interested in boosting the amateur radio content, so if YOU have developed an exciting amateur radio project, please contact Jim by writing to him at EA, 180 Bourke Road, Alexandria 2015 or phoning him on (02) 693 6620 – to discuss the possibility of publishing it as a contributed article.

Take a look at the new, rejuvenated *Electronics Australia* – on sale at your newsagent at the beginning of every month. Or subscribe now, by phoning (02) 693 9517 or 693 9515.

FEATURES IN OUR DECEMBER ISSUE:

AUSTRALIA'S SCHOOL OF THE AIR

For almost 40 years, the RFDS radio network has been providing over-the-air lessons for Australia's outback kids. A look at the School of the Air, written by Mervyn Eunson, VK4SO.

HIGH SPEED PHOTOGRAPHY WITH A VIDEO CAMCORDER

Take advantage of the high speed electronic shutter on your video camcorder, to examine things like a smashing light globe. Tom Moffat explains how...

HAM TALK

Another article in our occasional series on amateur radio topics. Here we look at the story of one of Australia's oldest hams: Clem Henry, VK2UR.

Electronics Australia

Australia's Top Selling Electronics Magazine

ICOM'S NEW HF TRANSCEIVER HAS MORE ARROWS THAN ANY OTHER HF TRANSCEIVER.

Frequency synthesis by Direct Digital Synthesizer which provides low noise floor and fast lock up.

Built in controller for automatic antenna tuning. Compatible with AH-3 HF automatic antenna tuner.

Twenty six memory channels. Channels 23 and 24 memorise both receive and transmit frequencies for split operation.

Semi break-in with adjustable delay timing and sidetone for CW operation.

Three scans: programmed, memory and selected mode memory.

105 dB dynamic range.

Band stacking register (identical to that of IC-781).

Automatic gain control (fast/slow).

20 dB receiver attenuator.

10 dB receiver preamplifier.

Switchable tuning steps. 20Hz, 50Hz, 1KHz and 1MHz.

General coverage receiver 30KHz to 33MHz. (500 KHz to 30 MHz guaranteed.)

Built in CI-V system for computer control (CT-17 required) and transceive function.

100 watts output on USB, LSB and CW transmitting and receiving. 100 watts FM and 40 watts AM with optional unit.

And one highly advanced feature that no other brand of transceiver will ever have. Call Melbourne on (03) 529 7582 or interstate on (008) 338 915 for your nearest Icom stockist.